

Attachment J

RSI Waste Analysis Plan
7/28/92

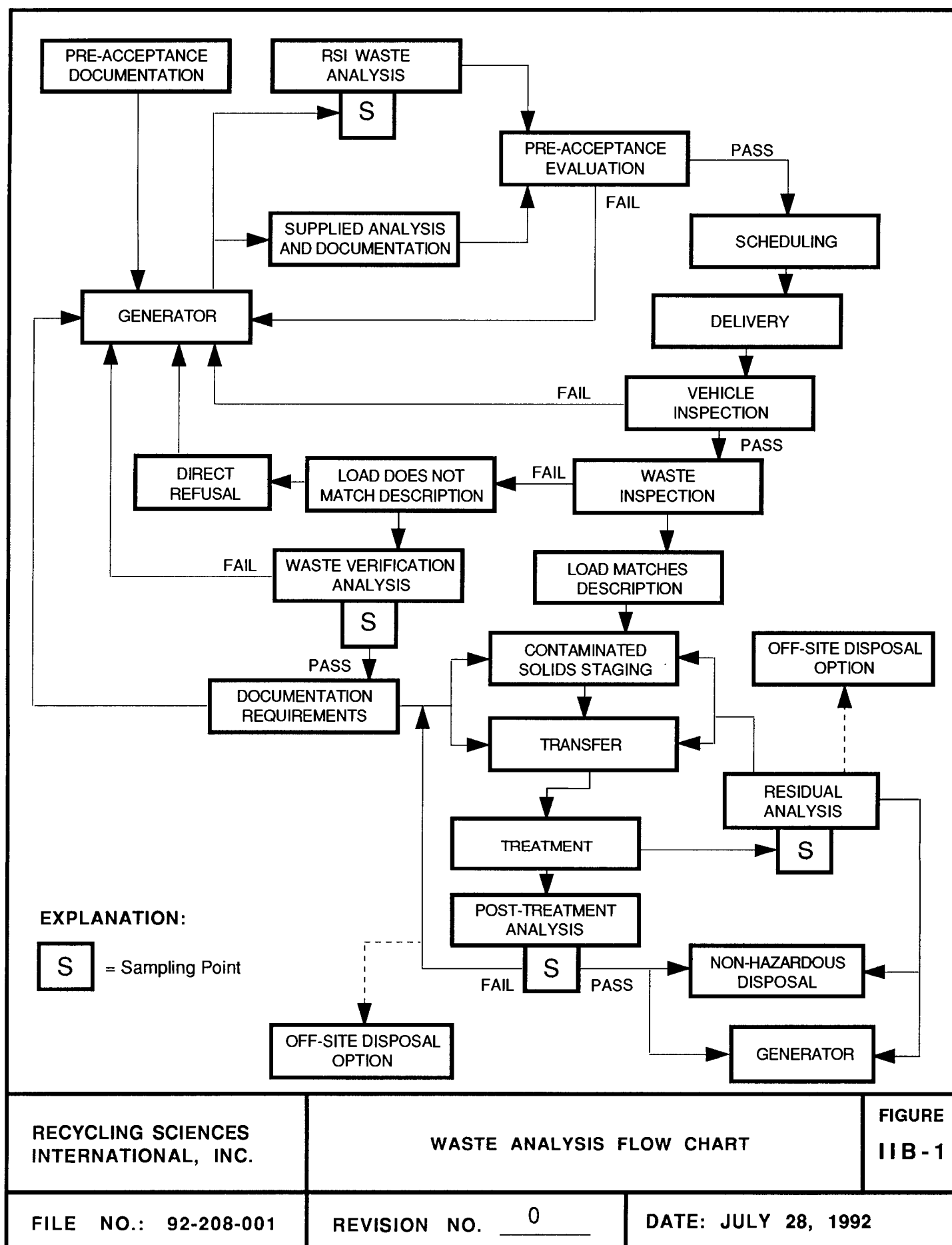
IIB WASTE CHARACTERISTICS

This section describes chemical and physical characteristics of the wastes to be treated and stored at RSI's Marana Facility, including residues from the treatment process. The Waste Analysis Plan (WAP) provides the information necessary to demonstrate that RSI has the ability to properly treat wastes using the DAVE System and identify potential waste acceptance, handling, or treatment residue problems. Additionally, RSI has developed a waste tracking system, which when combined with required pre-acceptance screening, provides RSI with sufficient information to identify and track each waste stream managed at the Facility. A flow chart depicting the flow of material through the Facility, including sampling points and critical decision paths is presented on *Figure IIB-1*. An overview of RSI's waste handling, analysis, and tracking procedures is provided below. A more comprehensive description of those procedures is provided in the Waste Analysis Plan (Section IIB-2).

Upon reasonable inquiry from a waste generator or transporter, RSI will send the prospective customer a document package notifying the generator or transporter of the required chemical and physical analyses to be performed on the waste, and specific forms which must be completed to contract RSI's services. This informational request also requires the generator to send a representative sample collected from the waste stream to RSI for analysis. That analysis is performed to confirm the composition of the waste material and ensure that the waste is compatible with, and can be treated, using the DAVE System. All waste shipments must satisfy RSI's pre-acceptance criteria before the wastes can be accepted at the Facility.

Wastes which have been pre-accepted by RSI will be scheduled for delivery, and pertinent information will be entered into the Facility operating record. Upon arrival at the site, all waste shipments will be inspected and, if appropriate, verification samples will be collected for analysis. At a minimum, RSI requires that verification samples be collected and analyzed prior to acceptance if either of the following occur:

1. Recycling Sciences International has reason to believe, or is otherwise notified, that the process or operation which has generated the waste has changed.
2. Results of waste inspections indicate that wastes arriving at the Facility do not match the waste descriptions on the accompanying manifests or shipping documents.



Waste analyses performed by RSI are not intended to fully characterize all of the physical and chemical compositions of each and every waste stream. Rather, those analyses are intended only as a means of providing the information necessary to properly treat or store the wastes and treatment residues in accordance with the requirements of 40CFR264. Waste analyses and corresponding waste tracking information become part of the operating record for the Facility.

After hazardous wastes are accepted for treatment by RSI, the wastes will be unloaded for processing through the DAVE System or transferred to the Staging Building for temporary storage. After treatment, byproducts (i.e., clean soils) will be containerized, sampled, and transferred to the Clean Solids Staging Area until the results of chemical analyses are received from the laboratory. Treatment residues also will be sampled and analyzed at regular intervals to evaluate treatment system effectiveness and determine appropriate treatment or disposal methodologies. If necessary and feasible, RSI will reprocess byproducts and select treatment residues (i.e., fines and decontamination water) through the DAVE System to remove residual contamination detected by the sampling. Alternatively, contaminated residues will be shipped off site for treatment and/or disposal at a authorized Treatment, Storage, or Disposal Facility (TSDF). Clean solids are shipped off site for use as clean fill material or properly disposed of in an authorized solid waste disposal facility. Other non-hazardous solid wastes are shipped off site for recycling or disposal in accordance with applicable federal and state regulations.

IIB-1 Physical and Chemical Characteristics of Wastes and Treatment Residues (40CFR264.13(a) and 270.14(b)(2))

IIB-1.a Incoming Wastes

Recycling Sciences International treats soils, sludges, and other solid media which have been contaminated with certain volatile and semi-volatile organic compounds and exhibit the hazardous waste characteristic of toxicity as defined in 40CFR261.24. Certain non-hazardous solid wastes (e.g., petroleum contaminated soils) which are compatible with the DAVE System also may be treated at the Marana Facility. Non-hazardous solid wastes will be handled in the same manner as hazardous waste at the Facility. Liquid wastes and any soils containing free liquids are not accepted at the Facility. Contaminated soils and other solids will be handled, stored and treated by RSI through operation of the following hazardous waste management units:

- Hazardous Waste Storage Unit - Staging Building
- Hazardous Waste Treatment Unit - DAVE System, Waste Acceptance and Feed Area, and the Clean Solids Handling Area.

The most common container that RSI uses is the trailer portion (i.e., end-dumps or roll off bins) of what is commonly referred to as a "tractor-trailer" rig. Drums, portable bins, and other containers also will be accepted by RSI on a case-by-case basis. Treatment processing rates will be controlled and maintained by staging waste shipments through the use of a pool of trailers, which can be stored on-site (i.e., in the Staging Building) with loads intact. Those bulk containers will have internal liners to seal openings and will be securely covered at all times during transport and storage. Covers will only be removed during unloading or waste acceptance inspections which are conducted inside the Waste Acceptance and Feed Building. Additionally, all containers will be stored inside the Staging Building. This containment methodology reduces the number of handling steps for each waste movement and reduces the potential for waste material releases.

The current configuration of the DAVE System limits the types of contaminated soils that can be treated at the Facility. Most of those limitations apply to the physical nature of the waste. The following types of contaminated soils are difficult to treat using the DAVE System:

1. **Soils having moisture contents above 50%.** Those soils require dewatering prior to shipment to the Facility. All soils are tested for moisture content as part of the pre-acceptance screening.
2. **Soils having free liquids.** Soils containing free liquids are not accepted at the Facility. A Paint Filter Test, as described in "*Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*" (EPA Publication No. SW-846), is included as part of RSI's standard pre-acceptance waste analysis.
3. **Soils having high "trap" metal content.** Soils having a high content of "trap" metal may require pre-acceptance screening or classification.
4. **Soils containing large cobbles and boulders.** Soils containing cobbles and boulders over about 6 inches in diameter cannot be easily crushed before they are fed into the DAVE System. Those soils will require pre-acceptance classification.
5. **Soils contaminated above threshold concentrations.** Recycling Sciences International has developed threshold concentrations for acceptance and treatment of incoming waste materials based on the ability of the DAVE System gas and water treatment sections to effectively and economically remove and contain the contaminants. Soils having contaminant concentrations greater than the treatment threshold and equal to or below

the acceptance threshold will be blended with clean soil to reduce the initial contaminant concentrations prior to treatment. Soils having contaminant concentration's above the acceptance threshold cannot be efficiently blended and will not be accepted at the Facility. Acceptance and threshold concentrations established by RSI, as well as estimated average treatment concentrations for each type of hazardous waste to be treated at the Facility are provided in *Table IIB-1*.

As indicated on the Part A Application provided in Section I, RSI is engaged in the treatment and storage of solid wastes that exhibit the characteristic of toxicity and have hazardous waste numbers D018 through D041. Additionally, as state above, certain non-hazardous solid wastes which are compatible with the DAVE System also may be stored and treated at the Facility. A complete list of the types of hazardous wastes treated at the Facility, including the EPA hazardous waste numbers, hazardous constituents, and selected chemical and physical characteristics is provided in *Table IIB-2*.

In its present configuration, the Facility's maximum annual capacity for treatment is 72,000 tons of contaminated soil, or about 250 tons per operating day. Recycling Sciences International's estimate of the maximum annual quantity of waste that will be treated at the Facility for each hazardous waste number is provided in *Table IIB-3*. Those estimates are based on RSI's best approximation of the percentages each waste will comprise of its annual operations and actual quantities of individual waste types treated in a given time period may vary from those presented in *Table IIB-3*. However, the cumulative annual quantity of waste treated at the Facility is not expected to exceed 72,000 tons.

IIB-1.b Treatment Residues

Treatment byproducts and residues generated by the processing of contaminated soil using the DAVE System include clean processed soils or other solids, baghouse and cyclone fines, spent carbon, fines accumulated in the Water Treatment Section, density-separated oil/water mixtures, clean treated water, and decontamination rinse water. Each of those byproducts and residues is described below.

TABLE IIB-1. THRESHOLD CONCENTRATIONS FOR ACCEPTANCE AND TREATMENT OF INCOMING WASTE MATERIALS

EPA Hazardous Waste Number	Hazardous Constituent	Acceptance Threshold Concentration ⁽¹⁾ (mg/kg)	Treatment Threshold Concentration (mg/kg)	Average Treatment Concentration (mg/kg)
D018	Benzene	15,000	5,000	500
D019	Carbon Tetrachloride	19,800	6,600	660
D020	Chlordane	30,000	10,000	1,000
D021	Chlorobenzene	52,500	17,500	1,750
D022	Chloroform	9,000	3,000	300
D023	o-Cresol	30,000	10,000	1,000
D024	m-Cresol	30,000	10,000	1,000
D025	p-Cresol	30,000	10,000	1,000
D026	Cresol	30,000	10,000	1,000
D027	1,4-Dichlorobenzene	75,000	25,000	2,500
D028	1,2-Dichloroethane	8,400	2,800	280
D029	1,1-Dichloroethylene	255	85	8.5
D030	2,4-Dinitrotoluene	30,000	10,000	1,000
D031	Heptachlor	30,000	10,000	1,000
D032	Hexachlorobenzene	30,000	10,000	1,000
D033	Hexachlorobutadiene	30,000	10,000	1,000
D034	Hexachloroethane	30,000	10,000	1,000
D035	Methyl ethyl ketone	15,000	5,000	500
D036	Nitrobenzene	3,000	1,000	100
D037	Pentachlorophenol	3,000	1,000	100
D038	Pyridine	2,475	825	82.5
D039	Tetrachloroethylene	2,400	800	80
D040	Trichloroethylene	2,400	800	80
D041	2,4,5-Trichlorophenol	3,000	1,000	100

NOTE: ⁽¹⁾ Wastes having contaminant concentrations greater than the treatment threshold and equal to or less than the acceptance threshold will be blended with clean soil prior to treatment.

TABLE IIB-2. PHYSICAL AND CHEMICAL CHARACTERISTICS OF HAZARDOUS WASTES TREATED AT RSI'S MARANA FACILITY(1)

EPA Hazardous Waste Number	Hazardous Constituent	Molecular Weight	Boiling Point (°C)	Solubility in Water (mg/L)	Specific Gravity at 20°C	Vapor Pressure mm Hg at 70°F
D018	Benzene	73.11	80	700	0.879	78
D019	Carbon Tetrachloride	153.84	77	800	1.595	90
D020	Chlordane	409.80	none	insoluble	solid	-(2)
D021	Chlorobenzene	112.56	132	500	1.107	9.3
D022	Chloroform	119.39	61	8,200	1.489	160
D023	o-Cresol	108.13	191	25,000	1.048	0.30
D024	m-Cresol	108.13	203	5,000	1.034	0.10
D025	p-Cresol	108.13	202	18,000	1.035	0.12
D026	Cresol	108.13	*(3)	*	*	*
D027	1,4-Dichlorobenzene	147.01	174	insoluble	1.458	1.5
D028	1,2-Dichloroethane	98.97	84	9,000	1.256	- -
D029	1,1-Dichloroethylene	96.44	37	insoluble	1.213	- -
D030	2,4-Dinitrotoluene	182.13	300	300	1.321	- -
D031	Heptachlor	373.35	none	insoluble	solid	- -
D032	Hexachlorobenzene	284.79	309	insoluble	2.044	0.0025
D033	Hexachlorobutadiene	260.76	215	- -	- -	- -
D034	Hexachloroethane	236.74	186	50	2.091	0.426
D035	Methyl ethyl ketone	72.10	80	350,000	0.805	81
D036	Nitrobenzene	123.11	211	1,900	1.205	0.172
D037	Pentachlorophenol	266.34	310	insoluble	solid	0.0025
D038	Pyridine	79.10	116	miscible	0.782	16
D039	Tetrachloroethylene	165.85	121	200	1.624	15
D040	Trichloroethylene	131.40	87	1,000	1.466	63
D041	2,4,5-Trichlorophenol	197.46	252	900	1.490	0.034

- NOTES: (1) The physical and chemical characteristics listed in this table are representative of each individual hazardous constituent. However, the wastes treated at RSI's Marana Facility are soils or other solid media contaminated with varying concentrations of one or more of those hazardous constituents. Therefore, the physical and chemical characteristics of the waste as a whole may vary significantly from the characteristics of individual constituents.
- (2) - - indicates information not available.
- (3) Boiling point, solubility in water, specific gravity, and vapor pressure are provided above for the specific isomers of Cresol.

**TABLE IIB-3. ESTIMATED ANNUAL QUANTITIES OF WASTE TREATED
AT RSI'S MARANA FACILITY**

EPA Hazardous Waste Number ⁽¹⁾	Hazardous Constituent	Expected Market Share (Percent)	Estimated Annual Quantities		
			Phase One ⁽²⁾ (Tons)	Phase Two ⁽³⁾ (Tons)	Phase Three ⁽⁴⁾ (Tons)
D018	Benzene	20	4,800	9,600	14,400
D019	Carbon Tetrachloride	1	240	480	720
D020	Chlordane	5	1,200	2,400	3,600
D021	Chlorobenzene	1	240	480	720
D022	Chloroform	1	240	480	720
D023	o-Cresol	1	240	480	720
D024	m-Cresol	1	240	480	720
D025	p-Cresol	1	240	480	720
D026	Cresol	1	240	480	720
D027	1,4-Dichlorobenzene	1	240	480	720
D028	1,2-Dichloroethane	1	240	480	720
D029	1,1-Dichloroethylene	5	1,200	2,400	3,600
D030	2,4-Dinitrotoluene	1	240	480	720
D031	Heptachlor	5	1,200	2,400	3,600
D032	Hexachlorobenzene	1	240	480	720
D033	Hexachlorobutadiene	1	240	480	720
D034	Hexachloroethane	1	240	480	720
D035	Methyl ethyl ketone	8	1,920	3,840	5,760
D036	Nitrobenzene	1	240	480	720
D037	Pentachlorophenol	1	240	480	720
D038	Pyridine	1	240	480	720
D039	Tetrachloroethylene	20	4,800	9,600	14,400
D040	Trichloroethylene	20	4,800	9,600	14,400
D041	2,4,5-Trichlorophenol	1	240	480	720
TOTAL		100%	24,000	48,000	72,000

- NOTES: (1) These waste codes represent solid wastes (primarily soil) which exhibit the characteristic of toxicity for the constituent listed
- (2) Assuming processing rate of 10 tons per hour, 8 hours per day, 300 days per year
- (3) Assuming processing rate of 10 tons per hour, 16 hours per day, 300 days per year
- (4) Assuming processing rate of 10 tons per hour, 24 hours per day, 300 days per year

Clean Processed Soil or Other Solids

The Dave System is designed to extract and contain organic contaminants from waste materials containing less than 5% by weight total organics. After treatment, greater than 95% of the incoming waste is clean processed soil. Those soils are sampled (as described in Section IIB-1.e) to verify the effectiveness of treatment, and shipped off-site for use as clean fill material or properly disposed of in an authorized solid waste disposal facility. Alternatively, clean processed soils will be returned to the generator.

Baghouse and Cyclone Fines

The insulated baghouse and cyclone components are designed to remove fines to prevent contaminant readsorption onto those particles. As described in Section IIA-3.b.3, fines removed in the baghouse and cyclone are contained within an enclosed conveyor and fed into containers for temporary storage. After a sufficient quantity of fines have collected in the containers, a representative sample is collected for analysis. Depending on the results of those analyses, fines will be reprocessed through the DAVE System or added to the clean processed soil for off-site reuse or disposal. Alternatively, contaminated fines may be shipped off-site for treatment and/or disposal at an authorized TSDF.

Spent Carbon

Both the gas and water treatment systems utilize carbon adsorption as a method of removing contaminants from the vapor and liquid phases, respectively. As the carbon beds become saturated with contaminants, the spent carbon will be removed and containerized and replaced with fresh carbon. The spent carbon is then shipped off site for regeneration at an authorized TSDF. As described in Section IIB-2.e, both interbed sampling of the gas and water process streams and waste characterization sampling of the spent carbon will be performed.

Fines Accumulated in the Water Treatment Section

A small percentage of fines may bypass the cyclone, baghouse, and condensing section of the DAVE System. These fines are removed from the process water in the fines settling tanks. At periodic intervals the fines are removed from the settling tanks, transferred to sealed containers and sampled for waste characterization analyses. Depending on the results of those analyses, the fines will be reprocessed through the DAVE System or added to the clean processed solids for off-site reuse or disposal.

Alternatively, contaminated fines may be shipped off site for treatment and/or disposal at an authorized TSDF.

Density Separated Oil/Water Mixtures

During treatment of some waste streams, hydrocarbon compounds with specific gravity's less than one may collect on the surface of the water in the process water storage tanks. These density separated oil/water mixtures will be skimmed from the surface of the process water and collected in the oil skimming tank. After a sufficient quantity of oil has collected in the tank, it will be sampled for waste characterization analyses. Depending on the results of those analyses, the oil/water mixture will be pumped from the tank, transferred to a sealed container, and shipped off site for recycling at an authorized TSDF (i.e., hazardous waste) or solid waste (i.e., used oil) recycling facility.

Clean Treated Water

After treatment of the process water in the Water Treatment Section of the DAVE System, clean process water is accumulated in the clean water storage tanks. That water will be sampled at regular intervals as described in Section IIB 2.e to verify the effectiveness of the water treatment system. Clean process water will then be reused in the treatment process for makeup water for the cooling and condensing system of the Gas Treatment Section, hydration of the incoming waste material (if necessary), and dust suppression in the Material Conveyance Section. All of the clean process water will be reused in the treatment process; therefore, no discharge of water will be required.

Decontamination Rinse Water

Rinse water generated by the decontamination of containers in the Waste Acceptance and Feed Building, as well as the periodic washing of the bermed, lined, and sealed concrete floors in the Waste Acceptance and Feed Building, Dave System Building, and the Clean Solids Handling Building, will be pumped directly into the process water storage tanks and processed through the DAVE System Water Treatment Section. Rinse water generated by the periodic washing of the bermed, lined, and sealed concrete floor of the Staging Building will be pumped into sealed containers, transferred to the DAVE System building, and pumped into the process water storage tanks for treatment. Because the decontamination water will be treated using the DAVE System, sampling of the water will not be performed.

Recycling Sciences International's estimate of the maximum quantity of treatment byproducts and residues is provided in *Table IIB-4*. The chemical characteristics of those residues will be determined by sampling and analysis in accordance with RSI's WAP.

IIB-2 WASTE ANALYSIS PLAN
(40CFR264.13(b) and (c) and 270.14(b)(3))

IIB-2.a Purpose and Objectives

Recycling Sciences International has developed this WAP to define the procedures used to obtain sufficient information for proper treatment and storage of the wastes and treatment residues handled at the Facility.

The primary objectives of this WAP are as follows:

1. Determine the physical and chemical properties of the waste prior to shipment to the Facility.
2. Determine if the waste is compatible with and can be treated using the DAVE System.
3. Verify the identity/composition of waste when it arrives at the Facility and when it is transferred for staging or treatment following acceptance.
4. Determine the chemical or physical properties of treatment residues prior to reprocessing or off-site recycling/disposal.
5. Promote safe handling and controlled transfer of waste and treatment residues at the Facility.

To meet these objectives, RSI has developed a comprehensive WAP which includes the following procedures:

1. Pre-acceptance (or Pre-shipment) Analysis Procedures
2. At-the-gate Verification Inspection/Analysis Procedures
3. On-site Waste Transfer Inspection Procedures
4. Treatment Byproduct and Residual Analysis Procedures.

TABLE IIB-4. ESTIMATED ANNUAL QUANTITIES OF TREATMENT BYPRODUCTS AND WASTE RESIDUALS

Source	Phase One (Tons) ⁽¹⁾	Phase Two (Tons)	Phase Three (Tons)
Incoming contaminated soils ⁽²⁾	24,000	48,000	72,000
Byproducts: Clean, Treated Soils	23,760	47,520	71,280
Residuals: ⁽³⁾ Fines, Baghouse, and Cyclone	240	480	720
Activated Carbon	165	330	495
Fines, Settling Tanks	120	240	360
Oil Phase	15	30	45

NOTES: ⁽¹⁾ Assumes 500 mg/kg average total concentration of the incoming waste stream
⁽²⁾ See *Table IIB-3* for assumptions on processing rates and cumulative quantities of incoming contaminated soils
⁽³⁾ All process waters are treated and reused within the DAVE System

IIB-2.b Pre-acceptance (or Pre-shipment) Analysis Procedures

Generators that may contract with RSI to treat their hazardous waste at the Facility will be sent pre-acceptance document packages which contain three documents: an RSI Waste Profile Sheet (*Exhibit IIB-1*), a Representative Sample Certification (*Exhibit IIB-2*), and an RSI Service Agreement (*Exhibit IIB-3*). After completion, those documents legally bind the generator to the waste characterization supplied in the Waste Profile Sheet.

The Waste Profile Sheet requires the generator to perform certain detailed physical and chemical analyses on representative samples of the wastes scheduled for treatment. The sampling interval established by RSI for generator waste characterization analyses is one representative sample for every 400 tons of contaminated soil. The generator also is required to send RSI a representative sample collected from the waste stream. That sample is submitted by RSI to a State-certified analytical laboratory for analysis of the same parameters performed by the generator. The analytical parameters selected are based on the type of hazardous waste proposed for treatment. Analytical requirements for Pre-acceptance waste characterization analyses are discussed in Section IIB-2.f.

The information supplied by the generator provides RSI with sufficient data to evaluate the treatability of the contaminated soils proposed for shipment to the Facility by the generator. The analytical results from the sample analyzed by RSI are compared to the results supplied by the generator to verify the characteristics of the waste and evaluate range of contaminant concentrations that can be expected in the waste material. The information is also used to evaluate the waste stream for compatibility with permitting and financial requirements and to identify any special handling requirements that may be necessary to store or treat the waste.. After the document package is returned to RSI, a receiving ticket having a unique ticket number is issued for the waste stream. That ticket serves as a control document for documenting the waste acceptance or refusal process. A sample Material Receiving Ticket is provided as *Exhibit IIB-4*.

If RSI receives a pre-acceptance document package that does not meet pre-acceptance criteria, it will be returned to the generator and noted on the Material Receiving Ticket. The generator will be informed of the rationale for refusal. If a waste stream appears to be compatible with RSI pre-acceptance criteria, a copy of the Waste Profile Sheet, Representative Sample Certification, and executed Service Agreement will be returned to the generator with a letter stating that RSI has the appropriate permits for and will accept the waste being shipped by the generator. After the waste is accepted and the acceptance letter is sent, the generator is contacted to schedule delivery of the waste to the Facility. Pre-acceptance documents and the acceptance letter are retained by RSI as part of the Facility's operating record.

No soils are accepted at the Facility unless accompanied by the copy of the pre-acceptance document package returned to the generator, a copy of the acceptance certification letter, and a completed and properly signed Uniform Hazardous Waste Manifest. A sample Uniform Hazardous Waste Manifest is provided as *Exhibit IIB-5*.

IIB-2.c At-the-gate Verification Inspection/Analysis Procedures

After a waste stream has been pre-accepted and delivered to the Facility, it will be inspected at the gate for compliance with safe shipping practices, including placarding, sealing of the vehicle, cleanliness of the truck, and the presence of the appropriate shipping papers. If the truck or supporting documentation is not presented in a manner satisfactory to RSI, the security guard posted at the gate will document the condition of the vehicle (or shipping documentation) in the Security Log and inform the Site Manager. The Site Manager will determine whether the load may be accepted on site. The Security Log also is utilized to track all vehicles that enter or leave the site. Because a guard will be posted at the gate 24 hours per day, RSI will be maintaining a continuous record of personnel and vehicles on site. A sample of this Security Log is provided as *Exhibit IIB-6*.

Once accepted on site, the partially completed Material Tracking Ticket will be attached to the shipping papers (i.e., Uniform Hazardous Waste Manifest, pre-acceptance documents, and acceptance letter) and the vehicle will be weighed and routed to the Waste Acceptance and Feed Building for further inspection (refer to *Exhibit IIA-19b* for traffic flow patterns at the Facility and the location of hazardous waste treatment units and support structures). Once inside the Waste Acceptance and Feed Building, RSI personnel will perform a second, more comprehensive inspection of the waste shipment. First, RSI personnel examine the accompanying Waste Profile Sheet and shipping manifest to determine if there are obvious discrepancies in container count or weight of the soils delivered. The level of personal protective equipment which will be worn by personnel inspecting or otherwise exposed to the load is confirmed, a ground wire is affixed to the truck body to ground static electricity, and flexible ducts are attached to the vehicle exhaust pipes to channel vehicle emissions out of the Waste Acceptance and Feed Building. The area is then cleared of unnecessary personnel, and the trailer is opened for inspection.

Typically, waste shipments will be secured and cover with tarps when they arrive on site and a surfactant will have been sprayed upon the surface of the waste, or it will be lined and covered with plastic sheeting. The tarps and layers of plastic (if present) will be removed by RSI to allow visual inspection of contaminated soils in the container. The visual appearance of the waste will be compared with the description on the Waste Profile to ensure that the waste shipped to the site is consistent with the pre-

acceptance information. Recycling Sciences International may need to completely uncover the load, or partially empty it to check the physical appearance of the contaminated soils. The results of the inspection will be recorded on the Material Receiving Ticket. If the soils appear to match the generators description and the confirming analyses run by RSI, the manifest for that shipment will be signed, and RSI will assume responsibility for the shipment. A log of each signed waste manifest will be maintained as part of the operating record to comply with annual reporting requirements, and to track the return of manifest copies to the generator and transporter. Copies also are forwarded to appropriate regulatory agencies. A sample Manifest Tracking Log is provided as *Exhibit IIB-7*.

After the manifest has been signed, the contaminated soils will be unloaded onto the bermed, lined, and sealed concrete floor of the Waste Acceptance and Feed Building, transferred into the feed acceptance hopper using a front end loader, and processed through the DAVE System. Alternatively, the container will be resealed, ticketed for identification, and transferred to the Staging Area for temporary storage prior to treatment.

Waste shipments which do not appear to be consistent with the waste profile and other supporting documentation will be sampled for verification analyses. The contaminated soils will then be reloaded (if necessary), covered, and secured, ticketed for identification, and transferred to a designated part of the Staging Building to await further decision making. The generator will be contacted, and a determination will be made to either (1) refuse acceptance of the shipment and immediately return the waste to the generator, or (2) submit the verification sample to the analytical laboratory for further waste characterization analyses. The results of that decision-making process are documented on the Material Receiving Ticket.

IIB-2.d On-site Waste Transfer Inspection Procedures

Wastes which have been routed to the Staging Building will be parked in this covered area until they are scheduled for treatment or off-site shipment (i.e., returned to the generator). The Staging Building will be inspected on a daily basis for leaks or spills of wastes. Details of that inspection, as well as RSI's inspection log are described in Section IIC - Procedures to Prevent Hazards. Bulk storage containers (i.e., semi-trailer end dumps and roll off bins) will be moved around the facility by the use of a yard truck. When a particular shipment of waste has been scheduled for treatment, the container will be transferred to the Waste Acceptance Building for unloading and processing through the DAVE System. The Plant Manager or Foreman on duty will record the time and date on the Material Treatment and Tracking Record, and initial this entry. Enough room is provided on this form to allow for several waste movements.

The Waste Acceptance and Feed Building is specially designed for safe unloading and handling of contaminated soils. As described in Section IIA- 3.b.1, the Waste Acceptance and Feed Building is an enclosed structure whose floor is bermed, lined with 30 mil Poly-Flex HDPE, and sealed with a chemical resistant sealer. Additionally, adequate water is available from the clean process water storage tanks for dust control. During waste transfer operations, the worker operating the loading equipment, and the direct supervisor will continually monitor the physical characteristics of the soils and the supervisor will monitor the breathing zone using a photo ionization detector (PID) or equivalent equipment.. Detected variations in the soils (i.e., moisture content, size, trap metal content, etc.) which could impact handling or treatment operations will be reported to the Plant Manager or Foreman on duty. Waste components which are not treatable will be separated from the treatable feed, and placed in drums or trailers for return to the generator. If elevated PID measurements (i.e., approximately 10% or 10 PID units above background) are detected in the worker's breathing zone for a sustained period of approximately 15 minutes, the supervisor will require personnel to don appropriate Level C protective gear (including an air purifying respirator with organic filter cartridges) until PID measurements are no longer elevated.

After the waste materials have been placed into the DAVE System Feed Acceptance Hopper (FAH1), the containers will be decontaminated using a steam-generating pressure washer. The trucks, tarps, and liners also will be decontaminated before the vehicles are allowed to depart from the Waste Acceptance and Feed Building. Additionally, the floor of the building will be pressure washed at least once every operating day. As shown in *Exhibit IIA-5a*, the bermed, lined, and sealed concrete floor of the building is sloped to a central drain and collection sump. Over spray from the pressure washer will be contained by the walls of the building. Decontamination residuals (i.e., liquids and fine solids) will be collected in the sump. Liquid residues will be transferred to the process water storage tanks using a diaphragm-type

pump and processed through the DAVE System Water Treatment Section to remove hazardous waste residues. Fine solid residuals will be transferred to the Feed Acceptance Hopper using shovels and buckets and processed through the DAVE System. Because both the liquid and solid residues from the decontamination process will be treated using the DAVE System, no sampling of those residuals will be required.

Occasionally, a tractor trailer containing contaminated soils may need to be moved off-site prior to scheduled treatment of its contents. In those cases, the container will be transferred to the Waste Acceptance and Feed Building and the contaminated soil will be transferred to another container following the same general procedures described above. After unloading the waste, the container will be decontaminated and shipped off site.

IIB-2.e Analysis Procedures for Treatment Residuals

Treatment byproducts and residues generated by the processing of contaminated soil using the DAVE System include clean processed soils or other solids, baghouse and cyclone fines, spent carbon, fines accumulated in the wastewater treatment section, density-separated oil/water mixtures, clean treated water, and decontamination rinse water. As discussed previously, the decontamination rinse water is treated using the DAVE System Water Treatment Section and sampling of the rinse water is not performed. Analysis procedures for the remaining byproducts and residues are discussed below.

Clean Processed Soil or Other Solids

After treatment, the clean processed soils leave the Vapor Extractor Unit and are deposited on an enclosed conveyer (C4) for delivery to the Clean Solids Handling Building (*Exhibit IIA-15*). Those soils are temporarily retained in the Clean Solids Hopper (FH4) until clean containers become available for loading. Containers will be transferred into the Clean Solids Handling Building using a yard truck and placed beneath the outlet chute at the end of the C5 enclosed conveyer, where they are filled. Pressurized spray jets at the end of the outlet chute spray a mist of clean process water into the chute to minimize dust. One representative soil sample will be collected from each container, the containers will be tarped and secured, and then moved to the Clean Solids Staging Area.

To evaluate the effectiveness of soil treatment, representative soil samples collected from each container will be sent to a State-certified analytical laboratory on a daily basis. The samples collected from the clean solids containers will be composited by the laboratory into one composite sample representative of the clean processed soils generated during that treatment day. Splits of each original sample will be retained

by the laboratory for possible future analysis. If laboratory analytical results from the composite sample indicate that contaminant concentrations are below applicable regulatory action levels (discussed in Section IIB-f), the clean processed soils will be shipped off site for use as clean fill material or properly disposed of in an authorized solid waste disposal facility. If, however, the laboratory analytical results exceed applicable regulatory action levels, the split samples will be analyzed to enable Facility personnel to identify the specific container(s) which require further treatment. Based on the results of the split-sample testing, RSI will transfer the suspect soils to the Staging Building for temporary storage or directly to the Waste Acceptance and Feed Building for reprocessing through the DAVE System. In some cases, RSI may choose to ship the contaminated soil off-site to an authorized TSDF for treatment and disposal because of unforeseen problems with the treatment of that particular waste stream.

Baghouse and Cyclone Fines

As described above, fine solids removed from the gas stream by the cyclone and baghouse are fed into sealed containers by an enclosed conveyor. After a sufficient quantity of fines have collected in the containers, a representative sample is collected for analysis. At a minimum, a sample of the fines will be collected on a weekly basis. If laboratory analytical results indicate that contaminant concentrations are below applicable regulatory action levels (as discussed in Section IIB-2.f), the fines will be transferred to the Clean Solids Staging Area and added to the clean processed soils for off-site reuse or disposal. However, if contaminants are detected in the fines at concentrations exceeding applicable regulatory action levels, the containerized fines will be transferred to the Staging Building for temporary storage or directly to the Waste Acceptance and Feed Building for reprocessing through the DAVE System. In some cases, RSI may choose to ship the contaminated fines off-site to an authorized TSDF for treatment and disposal.

Spent Carbon

As discussed in Section IIA-3.b.4 and IIA-3.c, the gas stream carbon adsorption units are configured in series, having two of the three carbon beds on line at all times. When the first carbon bed in series is nearly saturated with contaminants (i.e., approximately 80%), a third bed is brought on line while the first is replaced. Hydrocarbon concentrations between the beds are continuously monitored and recorded using Ratfish detectors connected to readouts in the control room. When hydrocarbons concentrations in the gas stream between the carbon beds exceed a preset level, an alarm sounds in the control room and the operator shuts off gas flow to the first carbon bed and brings the third carbon bed on-line as a backup (i.e., the second carbon bed becomes the primary treatment vessel). A sample is then collected of the *spent* carbon and shipped to the laboratory for waste characterization analyses in accordance with the analysis

requirements of the facility selected for regenerating the carbon. After receipt of those analytical results, the spent carbon will be shipped off-site for regeneration at an authorized TSDF, and fresh carbon will be placed in the carbon bed.

The Water Treatment Section carbon adsorption units also are arranged in series. Interbed samples of the water stream are collected from two sampling ports located between the first and second, and between the second bed and the Clean Water Storage Tanks. Treated process water is sampled and analyzed from those two ports on a daily basis, or more frequently if deemed necessary. Those samples will be collected at the end of each day of operations and analyzed on a 12- to 24-hour turnaround basis. In most cases, the analytical results will be available early the next day. Analytical results from those samples will be used to evaluate contaminant loading in the carbon beds and to determine whether the treated water is suitable for clean solids hydration. If the results of the interbed sampling indicate that the carbon in the first bed needs to be replaced, process water flow through that bed is shut off and a representative sample of the carbon is collected for waste characterization analyses. After receipt of those analytical results, the spent carbon will be shipped off-site for regeneration at an authorized TSDF, and fresh carbon will be placed in the carbon bed.

Fines Accumulated in the Water Treatment Section

Fines which bypass the cyclone, baghouse, and condensing section of the DAVE System are removed from the process water in the Fines Settling Tanks. At periodic intervals, the fines are removed from the settling tanks, transferred to sealed containers, and sampled for waste characterization analyses. At a minimum a sample of the fines will be collected every 60 days. If laboratory analytical results indicate that contaminant concentrations are below applicable regulatory action levels (as discussed in Section IIB-2.f), the fines will be transferred to the Clean Solids Staging Area and added to the clean processed soils for off-site reuse or disposal. However, if contaminants are detected in the fines at concentrations exceeding applicable regulatory action levels, the containerized fines will be transferred to the Staging Building for temporary storage or directly to the Waste Acceptance and Feed Building for reprocessing through the DAVE System. In some cases, RSI may choose to ship the contaminated fines off-site to an authorized TSDF for treatment and disposal.

Density Separated Oil/Water Mixtures

Density separated oil/water mixtures skimmed from the Process Water Storage Tanks and stored in the Oil Skimming Tank will be sampled after a sufficient quantity of liquid has collected in the tank. At a minimum, the oil/water mixtures will be sampled once every 60 days. If laboratory analytical results indicate that contaminant concentrations are below applicable regulatory action levels (as discussed in Section IIB-2.f), the oil/water mixture will be removed from the tank, placed in sealed containers, and shipped off-site for recycling at an authorized solid waste (i.e., used oil) recycling facility. However, if contaminants are detected in the oil/water mixture at concentrations exceeding applicable regulatory action levels, the containerized liquids will be shipped off-site for treatment and disposal at an authorized TSDF.

Clean Treated Water

As discussed above, samples of treated process water will be collected daily from a sampling port located between the second carbon bed and Clean Water Storage Tanks. Therefore, the concentration of contaminants (if any) in the water accumulating in the Clean Water Storage Tanks will be well defined. As a redundant check on the daily process water analyses, a sample will be collected from the Clean Water Storage Tanks once every 60 days. As stated previously, all of the clean treated water is reused in the DAVE System during treatment of contaminated soils; therefore, no discharge of water will be required.

IIB-2.f Analytical Parameters and Test Methods

The procedures defined in this WAP require the collection and analysis of the following samples: pre-acceptance waste characterization samples, acceptance verification samples, post-treatment verification samples, and treatment residue characterization samples. The analytical parameters that will be tested for each category of samples, as well as the rationale for those parameters and the test methods to be followed are discussed below:

Pre-acceptance Waste Characterization Samples

Pre-acceptance waste characterization samples include the samples collected and analyzed by the generator, as well as the sample provided by the generator for analysis by RSI. The purpose of those samples is to provide RSI with sufficient data to evaluate the treatability of the contaminated soils proposed for treatment and define the characteristics of that waste. As discussed above, RSI treats soils,

sludges, and other solid media which have been contaminated with certain volatile and semi-volatile organic compounds and exhibit the hazardous waste characteristic of toxicity as defined in 40CFR261.24. Certain non-hazardous solid wastes (e.g., petroleum contaminated soils) which are compatible with the DAVE System also may be treated at the Marana Facility. Therefore, based on the hazardous constituents of those waste types and the information needed by RSI to determine the treatability of the waste (i.e., total contaminant concentration, physical state, moisture content, etc.), pre-acceptance waste characterization samples will be analyzed for the following parameters: leachable (i.e., TCLP) concentrations of the volatile and semi-volatile organic compounds which comprise EPA Hazardous Waste Numbers D018 through D041; total concentrations for the hazardous constituents expected to be present in the waste, presence of free liquids (i.e., paint filter test), specific gravity, moisture content, and pH. Additional analyses (i.e., metals, total petroleum hydrocarbons, etc.) may be requested by RSI on a case-by-case basis depending on the source of the waste and the generators description of its composition.

The analytical parameters, EPA Hazardous Waste Numbers (where applicable), and the EPA Test Methods that will be followed for analysis of the pre-acceptance waste characterization samples is provided on *Table IIB-5*. The maximum contaminant concentrations (MCCs) defined in 40CFR261.24, as well as the threshold concentrations established by RSI for the acceptance and treatment of incoming waste materials are also provided on *Table IIB- 5*. The MCCs and threshold acceptance and treatment concentrations will be compared to the analytical results for the pre-acceptance samples as part of RSI's evaluation of the waste for acceptance.

Acceptance Verification Samples

Acceptance verification samples will be collected by RSI from waste shipments which do not appear to be consistent with the Waste Profile and other supporting documentation. The purpose of those samples is to verify the characteristics of the waste prior to acceptance for treatment. As such, the acceptance verification samples will be analyzed for the same parameters listed above for the pre-acceptance waste characterization samples (refer to *Table IIB-5* for the analytical parameters and test methods). However, depending on the type of discrepancy identified during the acceptance inspection, a reduced or expanded list of parameters may be selected for analysis.

Post-treatment Verification Samples

Post-treatment verification samples include samples of clean processed soils, baghouse and cyclone fines, clean treated water (both interbed samples from the Water Treatment Section and samples from the Clean Water Tanks), and fines from the settling tanks in the Water Treatment Section. The purpose of those

TABLE IIB-5. SUMMARY OF ANALYTICAL PARAMETERS, TEST METHODS, EPA MAXIMUM CONTAMINANT CONCENTRATIONS, AND RSI THRESHOLD CONCENTRATIONS FOR WASTE, BYPRODUCT, AND RESIDUE SAMPLES

EPA Hazardous Waste Number	Analytical Parameter(1)	EPA Analytical Method(2)	EPA Maximum Contaminant Concentration for Toxicity Characteristic ⁽³⁾ (milligrams per liter)	Acceptance Threshold Concentration (mg/kg)	Treatment Threshold Concentration (mg/kg)
D018	Benzene	8240, 8020	0.5	15,000	5,000
D019	Carbon Tetrachloride	8240, 8010	0.5	19,800	6,600
D020	Chlordane	8080	0.03	30,000	10,000
D021	Chlorobenzene	8240, 8010, 8020	100.0	52,500	17,500
D022	Chloroform (THM) ⁽⁵⁾	8240, 8010	6.0	9,000	3,000
D023	o-Cresol	8270, 8040	200.0 ⁽⁶⁾	30,000	10,000
D024	m-Cresol	8270, 8040	200.0	30,000	10,000
D025	p-Cresol	8270, 8040	200.0	30,000	10,000
D026	Cresols (Total)	8270, 8040	200.0	30,000	10,000
D027	1,4-Dichlorobenzene	8270, 8240, 8010, 8020	7.5	75,000	25,000
D028	1,2-Dichloroethane	8240, 8010	0.5	8,400	2,800
D029	1,1-Dichloroethylene	8240, 8010	0.7	255	85
D030	2,4-Dinitrotoluene	8270	0.13	30,000	10,000
D031	Hepatachlor	8080	0.008	30,000	10,000
D032	Hexachlorobenzene	8270	0.13	30,000	10,000
D033	Hexachlorobutadiene	8270	0.5	30,000	10,000
D034	Hexachloroethane	8270	3.0	30,000	10,000
D035	Methyl ethyl ketone	8240, 8015	200.0	15,000	5,000
D036	Nitrobenzene	8270	2.0	3,000	1,000
D037	Pentachlorophenol	8270, 8040	100.0	3,000	1,000
D038	Pyridine	8270	5.0	2,475	825
D039	Tetrachloroethylene (PCE)	8240, 8010	0.7	2,400	800
D040	Trichloroethylene (TCE)	8240, 8010	0.5	2,400	800
D041	2,4,5-Trichlorophenol	8270, 8040	400.0	3,000	1,000
	Free Liquids (paint filter test)	9095	— ⁽⁷⁾	--	--

TABLE IIB-5. SUMMARY OF ANALYTICAL PARAMETERS, TEST METHODS, EPA MAXIMUM CONTAMINANT CONCENTRATIONS, AND RSI THRESHOLD CONCENTRATIONS FOR WASTE, BYPRODUCT, AND RESIDUE SAMPLES (Continued)

EPA Hazardous Waste Number	Analytical Parameter(1)	EPA Analytical Method(2)	EPA Maximum Contaminant Concentration for Toxicity Characteristic ⁽³⁾ (milligrams per liter)	Acceptance Threshold Concentration (mg/kg)	Treatment Threshold Concentration (mg/kg)
	Specific Gravity	ASTM	--	--	--
	Moisture Content	ASTM	--	50%	50%
	pH	9040	--	4-10	4-10

- NOTES:
- (1) Analytical parameters were selected based on the composition of hazardous wastes treated and stored at the Facility.
 - (2) Source: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA Publication SW-846, Third Edition, 1987. For RCLP analyses, the sample extraction will be performed using EPA Method 1311.
 - (3) Source: Title 40 of the Code of Federal Regulations, Part 261.24, Characteristic of Toxicity.
 - (4) The regulated levels presented in this table are derived from currently available regulations and guidance documents. Because closure of the Facility is not expected to be initiated for many years, the most recently published regulatory levels available at the time of closure will be used during implement of this Plan.
 - (5) Trihalomethane.
 - (6) If o-, m-, and p-Cresol concentrations cannot be differentiated, the total Cresol concentration will be used.
 - (7) - = none established

samples is to provide RSI with the information needed to evaluate the effectiveness of the treatment system and to determine if the processed soils, fines, and treated water require additional treatment prior to reuse or disposal. To meet that objective, the post-treatment verification samples will be analyzed for the leachable (i.e., TCLP) concentrations of the hazardous constituents that were present in the original incoming waste material. For example, if the incoming waste was soil contaminated with benzene (i.e., D018) and tetrachloroethylene (i.e., D039), the post-treatment verification samples will be analyzed for the leachable concentration of those contaminants. Other parameters also may be requested on a case-by-case basis depending on the composition of the incoming waste materials. The results of those analyses will be compared to the applicable MCCs defined in 40CFR261.24 for the characteristic of toxicity or other applicable regulatory guidance levels for compounds not listed in 40CFR261.24 (e.g., TPH). The analytical parameters that will be analyzed for each hazardous waste that can be treated at the Facility, as well as the corresponding EPA test method and MCCs are provided in *Table IIB-5*.

Treatment Residue Characterization Samples

Treatment residue characterization samples include samples of spent carbon and density-separated oil/water mixtures. The purpose those samples is to determine the characteristics of the residues in order to select the appropriate off-site treatment and/or disposal method. The characteristics of the treatment residues will be dependent on the characteristics of the incoming waste material from which the residues were produced. Additionally, the TSDF or solid waste management facility which is selected by RSI for treatment and/or disposal of the residues may require specific analyses to evaluate if the residues are compatible with the management practices at their facility. As such, the treatment residue characterization samples will be analyzed for the leachable (i.e., TCLP) concentrations of the hazardous constituents that were present in the original incoming waste material, as well as any additional analyses requested by the TSDF or solid waste management facility. The results of those analyses will be compared to the applicable MCCs defined in 40CFR261.24 for the characteristic of toxicity or other applicable regulatory guidance levels for compounds not listed in 40CFR261.24 (e.g., TPH). The analytical parameters that will be analyzed for each hazardous waste that can be treated at the Facility, as well as the corresponding EPA test method and MCCs are provided in *Table IIB-5*.

IIB-2.g Sampling Methods and Frequency of Analyses

The sampling methods to be followed for the pre-acceptance waste characterization, acceptance verification, post-treatment verification, and treatment residue characterization samples identified in this WAP are listed in *Table IIB-6*. The frequency for collection of each type of sample also is listed in that Table. The specific procedures identified in EPA Publication SW-846, Test Methods for Evaluating Solid

Waste, Physical/Chemical Methods, Third Edition, 1987 will be followed by RSI personnel for each of the sampling methods identified in Table IIB-6. General sampling procedures which apply to all the sampling methods are described below.

Sampling Equipment Decontamination

Tools and equipment used during sampling will be thoroughly cleaned prior to each sampling event to minimize the potential for cross-contamination and maintain sample integrity prior to laboratory analysis. Sampling equipment will be washed over a bucket containing Liquinox™ or an equivalent detergent and water, then rinsed with tap water. Finally, deionized water will be "spray-rinsed" over the equipment and collected in a bucket. Decontaminated equipment will be dried using lint-free towels or cloths, or allowed to air dry. Provisions will be made for containing the rinsates that are produced during the equipment decontamination process. Detergent and rinse waters will be changed at least once each sampling day, or more frequently as deemed necessary by sampling personnel.

Disposal of Contaminated Sampling Residuals

Decontamination rinsate that may be produced during sampling will be contained on site in buckets. Following final decontamination of sampling equipment, the rinsate will be poured into the Process Water Storage Tanks and processed through the Water Treatment Section of the DAVE System.

Sample Containers and Preservation

The analytical laboratory will provide pre-cleaned sample containers. Sample containers will be packed in coolers containing blue ice to help maintain the temperature of the samples at 4°C. Additional sample containers and preservation methods, if necessary, would be selected in accordance with the guidelines provided in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA Publication SW-846 (EPA, 1987).¹

Sample Packaging and Shipping

Individual sample containers will be protected with a layer of plastic "bubble wrap" or similar packaging material; placed within self-sealing, plastic bags; and stored in portable coolers containing blue ice. Empty space within each cooler will be filled with inert materials for the purpose of cushioning the

¹ U.S. Environmental Protection Agency, 1987: *Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, 3rd Edition.

TABLE IIB-6. SAMPLING METHODS AND FREQUENCY FOR PRE-ACCEPTANCE, ACCEPTANCE VERIFICATION, POST-TREATMENT VERIFICATION AND TREATMENT RESIDUE SAMPLES

SAMPLE CATAGORY	MATRIC	FREQUENCY	SAMPLING METHOD
Pre-Acceptance Waste Characterization Samples	Soil	one sample for every 400 tons of waste	Various samples collected by generator
Acceptance Verification Samples	Soil	various ⁽¹⁾	Trowel or scoop
Post-treatment Verification Samples			
• Clean Processed Soils	Soil	one sample per container	Trowel or scoop
• Baghouse and Cyclone Fines	Soil	one sample per week	Trowel or scoop
• Interbed Samples from the Water Treatment System	Water	one sample per day	Sampling port
• Treated waste from the Clean Water Storage Tanks	Water	one sample every 60 days	Coliwasa
• Water Treatment Section Fines	Soil	one sample every 60 days	Trowel or scoop
Treatment Residue Characterization Samples			
• Spent Carbon	Carbon	Various ⁽²⁾	Thief sampler
• Oil/Water Mixture from Oil Skimming Tank			

NOTES:

- (1) Acceptance verification samples will be collected from waste shipments which do not appear to be consistent with the accompanying Waste Profile and other supporting documentation.
- (2) Samples of spent carbon are collected whenever a carbon bed in either the Gas Treatment Section or Water Treatment has reached approximately 80% of its adsorptive capacity. The time period for replacement of the carbon beds will vary depending on the concentration of the contaminants in the incoming waste material.

samples and preventing possible breakage during shipment. Sample containers will be handled using standard chain-of-custody procedures (described below) and, if necessary, will be stored overnight in a secure, indoor area. Sample containers will be sealed using chain-of-custody tape to detect possible tampering or possible unauthorized entry.

Samples will be transported to the laboratory within approximately 48 hours of collection. Shipping containers will meet applicable state and federal DOT requirements for safe transport. Additionally, all containers will be sealed in a manner such that possible tampering or unauthorized entry can be detected immediately upon receipt by the testing laboratory. The chain-of-custody forms will be sealed in clear plastic envelopes and affixed to the outside of the shipping containers.

Sample Documentation

Sample documentation will include sample labels, sample seals, sample log book, and chain-of-custody forms. Samples will be labeled at the time of collection, and the following information will be included on each label:

- Sample location
- Sample ID number
- Preservative (if applicable)
- Matrix
- Date and time of collection
- Initials of collector.

To discourage tampering or unauthorized opening of samples, chain-of-custody seals will be placed over each container lid and will include the following information:

- Sample ID number
- Initials of sample collector.

Information pertinent to the sampling will be recorded in a hard-bound log book. This includes, but is not limited to, the following:

- Location of site
- Site personnel contact(s)
- Date and time of collection

- Sampling locations, sample identification numbers, and methodology
- Number and volume of samples taken
- Field observations (i.e., sample descriptions)
- Sample distribution
- Signatures of sampling personnel.

Sufficient information will be recorded so that future RSI or regulatory personnel can reconstruct the sample program without having to consult directly with the sampling personnel.

Chain-of-custody Record and Sample Analysis Request Form

After each sample has been collected, the appropriate chain-of-custody record, which also will serve as the sample analysis request form, will be completed. The chain-of-custody record will accompany the samples at all times. The chain-of-custody for possession and responsibility of a sample will be documented from the time and place of sample acquisition to the time and place of its final destination. Personnel initially collecting the samples will be responsible for the care and custody of the samples until they have been transferred to delivery or laboratory personnel.

The information recorded on the chain-of-custody record will include the sample identification number, date, time, matrix, number of containers, sampler's signature, facility name and address, and analysis requested. Each person or organization who relinquishes and/or receives the samples will sign and date the form in the appropriate space. Original records will remain with the samples until relinquished to the laboratory.

Laboratory personnel receiving the samples will enter the following information on the form:

- Name of person receiving the samples
- Laboratory sample numbers
- Condition of the samples received
- Date and time of sample receipt.

Quality Control Samples

Quality control (QC) samples are required to document the accuracy and precision of the sampling. The QC samples that will be collected for this sampling program include duplicate samples, and travel equipment blank samples. Each of these types of QC samples is described below.

- **Duplicate Samples.** Personnel will collect "*blind*" field duplicate samples at the rate of approximately 10% of the total number of samples collected. Care will be taken to ensure that as "*true*" a duplicate as possible is obtained. Each duplicate sample will be collected, numbered, packaged, and sealed in the same manner as other samples so that it cannot be identified as a duplicate by laboratory personnel.
- **Travel Blanks.** Travel blank samples, consisting of analyte-free water, will be supplied by the analytical laboratory and will accompany each shipment of sample coolers from the laboratory to the site and back to the laboratory. Travel blanks will be analyzed for the same analytes selected for the samples collected by RSI.
- **Equipment Blanks.** Equipment blanks will be collected to ensure that sampling equipment has been cleaned effectively. After decontamination, equipment blanks will be obtained by pouring deionized water over the surfaces of the sampling tools and collecting the water in appropriate sample containers. The equipment blanks will be shipped to the laboratory and analyzed for the samples collected by RSI.
- **Laboratory QA/QC Samples.** Laboratories routinely perform matrix spike and lab duplicate analyses on samples as a Quality Control (QC) check. As recommended by EPA Region IX, at least one sample per week or one per 20 samples (including blanks and duplicates), whichever is greater, will be designated as the "*lab QC sample*" for the matrix spike and lab duplicate analyses.

IIB-2.h Additional Waste Analysis Requirements for Ignitable, Reactive, or Incompatible Wastes (40CFR264.13 (b)(6)and 264.17)

Ignitable and/or reactive wastes will not be accepted for treatment by RSI and the procedures established in Sections IIB-2.b and IIB-2.c of this WAP guard against unauthorized wastes entering the Facility. Additionally, none of the wastes stored or treated at the Facility are incompatible.

Attachment K

Personnel and Training Documents
7/28/92

IIE PERSONNEL TRAINING PROGRAM

IIE-1 Introduction

This section outlines the RSI Personnel Training Program for hazardous waste management procedures in accordance with 40CFR264.16.

The RSI Personnel Training Program is used as the basis for training personnel regarding the equipment, methods, and systems used in the management of hazardous wastes. In the training program, employees are instructed in the general nature of chemical and chemical waste hazards, the purpose of RCRA, the importance of maintaining compliance with hazardous waste regulations, waste handling and storage procedures, and the Contingency Plan emergency procedures. Training for supervisory personnel is planned to include attendance at one or more formal conference or training program on hazardous waste management.

IIE-2 Hazardous Waste Management Training Program (40CFR264.16(c) and (d)(3))

The Hazardous Waste Management Training Program is used in classroom training for introductory training and periodic review. A typical outline of a training program utilized by RSI is included in *Exhibit IIE-1*. All personnel having hazardous waste responsibilities are required to complete classroom training in addition to on-the-job training. Personnel also receive a classroom review session each year. In addition to classroom training, operating personnel undergo extensive on-the-job training regarding how to safely and effectively operate and control the RSI processing equipment.

IIE-3 Personnel and Relevance of Training to Job Description (40CFR264.16(a)(2) and (3) and 264.16 (d)(1) and (2))

The Compliance/Health & Safety Manager is responsible for assuring that hazardous waste management procedures have been presented to all supervisors and waste handling personnel. The training program provides training to personnel at levels that are relevant to their positions within the Facility. Levels of training for hazardous waste personnel are provided in *Table IIE-1*. Interim job titles and descriptions of all personnel that undergo training are listed in *Table IIE-2*.

TABLE IIE-1. LEVELS OF HAZARDOUS WASTE TRAINING FOR HAZARDOUS WASTE PERSONNEL

	Personal Safety	Release Prevention and Response	Contingency Plan	Emergency Procedures	Management and Practices	Record Keeping	Hazardous Waste Handling & Operations
Supervisory Personnel	G	G	G	G	G	G	G
Operating Personnel	G	G	L	G	L	L	G

G = General instruction
L = Limited instruction

Supervisory Personnel

Site Manager
Plant Manager
Compliance/Health & Safety Manager
Chemical Engineer/Quality Control Officer
Maintenance Supervisor
Emergency Coordinator

Operating Personnel

Board Operator
Outside Operator
Plant Electrician/Instrument Specialist
Sampling Technician
Helpers

TABLE IIE-2. INTERIM JOB TITLES AND DESCRIPTIONS FOR HAZARDOUS WASTE MANAGEMENT PERSONNEL

Site Manager

Responsible for overall site operations, from a safety, public relations, marketing, compliance, financial, and risk management standpoint.

Must understand and enforce RSI policies and procedures. Key decision maker in all situations, though yields in matters of health and safety or emergency procedures to the Emergency Coordinator.

Plant Manager

Responsible for supervising and coordinating all Facility operations. Responsible for the supervision and management of all operational, waste handling, maintenance, and plant support personnel.

Responsible for keeping a safe working environment by implementing site safety policies, as directed by the Compliance/Health & Safety Manager. Responsible for ongoing development and generation of site safety documentation in tandem with Compliance/Health & Safety Manager.

Responsible for training and education of Facility employees, in accordance with RSI training protocol. Responsible for assisting the Emergency Coordinator in situations requiring the implementation of RSI's Contingency Plan.

Responsible for preparing detailed operating procedures, budgets, and reports as required, as well as providing key input on Facility design and construction.

**TABLE IIE-2. INTERIM JOB TITLES AND DESCRIPTIONS FOR HAZARDOUS
WASTE MANAGEMENT PERSONNEL (CONTINUED)**

Responsible for working with other departments to ensure timely handling, treatment, and scheduling of waste streams.

Must understand and comply with RSI policies and procedures.

Compliance/Health & Safety Manager

Must provide direction, guidance and enforcement in the implementation of RSI's Site Safety Program.

Serves as RSI's primary contact with regulatory agencies.

Supervisory responsibilities for compliance and safety in the design, construction, operation, maintenance, and repairs of the Facility.

Responsible for assuring the protection of facilities against unknowing or willful intrusion by outsiders.

Conducts safety inspections to ensure protection of human health and the environment. Responsible for holding safety meetings, and providing guidance and safety briefings for new employees.

Must assure that RSI facilities, equipment, protective clothing, and training provide adequate protection for all employees involved in hazardous waste management. Must arrange for training in fire extinguisher operation, first aid and CPR, respirator care and use, eye protection devices, fire retardant garments, etc., and maintain the records thereof.

Responsible for assuring RSI's compliance with OSHA mandated Hazard Communication Standard to include employee training and records, Material Safety

**TABLE IIE-2. INTERIM JOB TITLES AND DESCRIPTIONS FOR HAZARDOUS
WASTE MANAGEMENT PERSONNEL (CONTINUED)**

Data Sheets (MSDS) acquisition, and/or preparation as required and records thereof. Responsible for assuring that all hazardous materials are properly identified using appropriate labels.

Responsible for development and supervision of RSI's Medical Monitoring Program and other programs implemented to protect the health of RSI employees.

Responsible for coordinating the generation and filing of required documents and permit applications.

Responsible for maintaining industrial accident/illness records.

Must understand and comply with RSI policies and procedures.

Chemical Design Engineer/ Quality Control Officer

Responsible for the development and monitoring of DAVE System operational parameters, performance standards, and the generation of technical reports and evaluations, as required.

Provide key input into DAVE System design, maintenance, modification, and construction. Provide technical recommendations for componentry upgrade or replacement.

Responsible for determinations of waste feed suitability for treatment, waste regulatory classification determinations, and pre-acceptance/acceptance or refusal decisions.

Responsible for the monitoring and development of workplace safety standards and decisions, MSDS generation or evaluation, and overall exposure assessments.

**TABLE IIE-2. INTERIM JOB TITLES AND DESCRIPTIONS FOR HAZARDOUS
WASTE MANAGEMENT PERSONNEL (CONTINUED)**

Responsible for the development, supervision and implementation of RSI's sampling and analysis protocol, and the creation and retention of required documentation.

Must understand and comply with RSI policies and procedures.

Board Operator

Responsible for the safe and efficient operation of the DAVE System and associated processes.

Responsible for the recording of process and emissions control operating records. Must provide assistance with the development of process operating parameters, general input in Facility operations and maintenance, and waste treatment scheduling.

Responsible for DAVE System start-up, non-emergency, and emergency shut-down procedures, as directed by the Compliance/Health & Safety Manager, Site Manager, Plant Operating Manager, or Quality Control Officer.

Must understand and comply with RSI policies and procedures.

Outside Operator

Responsible for the supervision and monitoring of the DAVE System componentry, to ensure safe and efficient operation.

Must stay in contact with the Board Operator at all times to ensure all components are operating as indicated by monitors in Control Room. Has primary responsibility in determining labor allocations and safety monitoring of all employees.

**TABLE IIE-2. INTERIM JOB TITLES AND DESCRIPTIONS FOR HAZARDOUS
WASTE MANAGEMENT PERSONNEL (CONTINUED)**

Works with Plant Manager in operation and inspection of Facility equipment and handling personnel needs.

Must understand and comply with RSI policies and procedures.

Maintenance Supervisor

Supervisory responsibility for the maintenance, repair and support of DAVE System operations, as directed by the Plant Manager.

Responsible for assuring maintenance of a safe working environment through application of site safety procedures.

Must understand and comply with RSI policies and procedures.

Sampling Technician

Responsible for the collection, documentation, and delivery of all required samples to the appropriate laboratory for analysis.

Responsible for assisting in the development of test procedures, sampling methods, and recordkeeping systems for waste streams managed at the Facility, in accordance with regulatory guidelines.

Responsible for the assembly and submittal of treatment performance data and supporting custody or protocol records.

Must understand and comply with RSI policies and procedures.

**TABLE IIE-2. INTERIM JOB TITLES AND DESCRIPTIONS FOR HAZARDOUS
WASTE MANAGEMENT PERSONNEL (CONTINUED)**

Plant Electrician/Instrument Specialist

Responsible for the overall performance of site electrical systems and electronics, as well as portable and fixed monitoring equipment.

Provides key input regarding equipment selection, repair and maintenance, as well as assistance in the design of appropriate safety protocol for all electrical equipment.

Must understand and comply with RSI policies and procedures.

Helpers

Responsible for operation, repair, and maintenance of all DAVE System processing and support equipment, Facility vehicles, and other structures and equipment, as needed. Receive instructions from all site supervisory personnel.

Must comply and respond, where necessary, to Site Safety Program requirements and emergency response procedures.

Must understand and comply with RSI policies and procedures.

Emergency Coordinator

Responsible for the evaluation and coordination of emergency response actions in accordance with RSI's Contingency Plan. Additional details regarding RSI's Contingency Plan are provided in Section IID.

Assists the Compliance/Health & Safety Manager with the design and implementation of RSI's Site Safety Program, having special emphasis on emergency preparedness and response training, evacuation procedures, and hazard assessments.

TABLE IIE-2. INTERIM JOB TITLES AND DESCRIPTIONS FOR HAZARDOUS WASTE MANAGEMENT PERSONNEL (CONTINUED)

Responsible for the establishment and development of site specific emergency response operating procedures, in coordination with the appropriate local response and medical agencies or departments.

Acts as representative for RSI, with the Site Manager, in all situations requiring outside emergency response or medical assistance.

Must understand and comply with RSI policies and procedures.

IIE-4 Training for Emergency Response (40CFR264.16(a)(3))

All employees are trained in emergency response procedures. This training includes instruction in procedures for reporting emergencies, responding to alarms and emergencies, procedures for controlling releases and fires, and evacuation procedures. Initial training occurs during the employee's safety briefing immediately upon assuming a position at RSI. Each employee is trained regarding how the Facility Contingency Plan (Section IID) is to be implemented. Emergency response procedures are periodically reviewed with employees during monthly safety meetings.

IIE-5 Training Director (40CFR264.16(a)(2))

The hazardous waste management training program is implemented by either the Compliance/Health & Safety Manager or by a qualified contractor. The employee or selected contractor will be certified in hazardous waste management training from an EPA approved program. Programs attended by the Manager and upper level supervisors include one or more of those listed in *Table IIE-3*.

TABLE IIE-3. HAZARDOUS WASTE MANAGEMENT TRAINING PROGRAMS

Programs Available:

OSHA 40-Hour Hazardous Materials Health and Safety
OSHA 8-Hour Hazardous Materials Health and Safety (REFRESHER COURSE)
OSHA 4-Hour Spill Response Practical Training
OSHA Hazardous Materials Supervisor Training
OSHA Hazardous Materials Emergency Response
OSHA Hazardous Materials Trainer Workshop
OSHA Confined Space Entry Intensive
OSHA Respirator Protection Intensive
NFPA Fire Brigade Training
CPR and First Aid Training

Training Locations:

Arizona State Environmental Technology Training Center (ASETT)
Region IX Training Center
Pima Community College
8202 E. Poinciana Dr.
Tucson, Arizona 85730

EnviroMD
3443 E. Fort Lowell Road
Tucson, Arizona 85716

Avra Valley Fire Department
16250 W. El Tiro Rd.
Marana, Arizona 85653

IIE-6 Implementation of Training Program (40CFR264.16(b)(d)(4) and (e))

Supervisors of waste handling personnel will receive formal training prior to appointment at the RSI Facility. New personnel complete this training program within 6 months of assignment of

responsibilities involving the handling and management of hazardous waste. No employee hired to work with hazardous wastes will work unsupervised prior to completion of the training program.

Employees are required to meet at least annually for review and update of this training program and to discuss and study the following subjects:

- All hazardous wastes currently being handled at the Facility, noting any changes in waste type, volume, source, characteristics, or location that have occurred during the past year.
- The status of storage and operating conditions and procedures, noting any areas where there are problems or potential for problems. Employees will participate in developing effective solutions to the problems identified.
- The requirements contained in hazardous waste regulations applicable to RSI, noting any changes that have occurred during the past year. Areas where maintenance of compliance is a problem will be identified and discussed, and effective solutions will be sought.
- Incidents which occurred in the past year that warranted use of the Contingency Plan, or other emergency or non-emergency situations. This review will focus on the cause of each incident and identification of steps to be taken to prevent or better handle such events in the future.

The annual review also will utilize the Facility's annual Hazardous Waste Report submitted to the Arizona Department of Environmental Quality as a working document for the review.

Records documenting the job title for each position involving hazardous waste management, job descriptions, names of employees, and completed training programs (both introductory and review) will be kept until closure of the Facility for current employees, and three years from the date of termination for former employees. The "*Employee Hazardous Waste Training Log*" used by RSI at the Facility is shown as *Exhibit IIE-2*.

Exhibit IIE-1

Hazardous Waste Management Training Program

EXHIBIT IIE-1

HAZARDOUS WASTE MANAGEMENT TRAINING PROGRAM SAMPLE COURSE OUTLINE

PIMA COUNTY COMMUNITY COLLEGE

Title: OSHA: Hazardous Materials Health & Safety

Initiator: Cheryl Childress

COURSE DESCRIPTION:

Overview of the accepted technologies designed to protect the health and safety of personnel handling hazardous materials. Includes basic toxicology; personal protection and safety; hazard identification systems; recognition and identification of hazardous materials; hazard classes and their properties; site emergencies; spill control and clean up. Meets OSHA requirements for business, industry, and government hazardous materials handlers.

Course Objectives:

1. Hazardous materials and the dangers they present
2. Proper safety procedures in handling hazardous materials
3. Health & safety codes and regulations
4. Safety equipment and its proper use
5. Accident prevention
6. Safe and proper reactions when dealing with accidents and emergencies.

The student will be able to:

1. Define DOT, OSHA, FAA, and EPA and understand who and what they regulate
2. Describe the difference between Hazardous Materials, Hazardous Waste, and Hazardous Chemicals
3. Describe how past incidents have influenced current regulations
4. Recognize and identify hazardous material
5. Describe the parts of a placard and label and understand their meaning
6. Describe the difference between pressurized and non-pressurized tanks
7. Describe the NFPA 704M system and its use
8. Describe the requirements of labeling in the workplace
9. Describe the routes of entry
10. Define TLV, LC50, LD50, PEL, IDLH
11. Define acute and chronic exposure
12. Describe the factors that influence individual response to exposure to a hazardous material
13. Describe the different types of respiratory protection and their advantages and disadvantages
14. Define the EPA four levels of protection

EXHIBIT IIE-1

15. Describe when and how respirators are used and when they must not be used
16. Describe the types of protective clothing available
17. Define a site safety plan, its purpose and contents
18. Describe the events of container failure
19. Draw a map of an incident site showing the different zones and their activities
20. Describe a decontamination area and its use and purpose
21. Describe sectors that may be needed during an accident
22. Define MSDS, its purpose, and the information it contains
23. Define the following: Flash point, flammable range, vapor density, specific gravity, ignition temperature
24. Name the nine (9) hazard classes
25. Name the major hazard of each group
26. Name the reasons for monitoring and the types of monitoring
27. Describe the procedures and reasons for recordkeeping
28. Describe the purpose of dams, dikes, and covers and describe their construction.

COURSE CONTENT:

I. Introduction

- A. Course relationship to environmental technology

II. What are hazardous materials?

- A. Historical perspective
- B. Current perspective
- C. Definitions of hazardous materials according to the following:
 1. DOT
 2. OSHA
 3. FAA
 4. EPA
 5. BENNER

III. Recognizing and identifying hazardous materials

- A. Occupancy
- B. Types of containers
- C. Markings
- D. Placards/Labels
- E. Detection devices
- F. Your senses

IV. Hazard Identification systems

- A. NFPA 704M System
- B. Placarding and Labeling

EXHIBIT IIE-1

V. Personal Protection and Safety

- A. Basic toxicology**
- B. Personal protection**

1. Respiratory protection

- a. Respirators**
- b. SCBA**
 - (1) Demand type**
 - (2) Positive pressure**
 - (3) Re-breathers**
 - (4) Other**

2. Skin protection

- a. Level D**
- b. Level C**
- c. Level B**
- d. Level A**

3. Nature/Natural

- a. Heat**
- b. Cold**

4. Selection of personal protective equipment

- a. Respiratory**
- b. Gloves**
- c. Clothing**
- d. Equipment**

VI. Site Planning

- A. Site Safety Plan definition and contents**
- B. Site Safety Plan development**
- C. General safety procedures**

VII. Site Emergencies

- A. Detection**
- B. Escape/Evacuation**
- C. Accident Causes**
- D. Zone Set up**

1. Hot Zone

- a. Personnel**
- b. Activities**
- c. Responsibilities**

EXHIBIT IIE-1

2. Warm Zone
 - a. Personnel
 - b. Activities
 - c. Responsibilities
3. Cool Zone
 - a. Personnel
 - b. Activities
 - c. Responsibilities
4. Decontamination
 - a. Personnel
 - b. Activities
 - c. Responsibilities
5. Medical/Treatment
 - a. Activities
 - b. Responsibilities
6. PIO/Recovery
 - a. Activities
 - b. Responsibilities

VIII. Reference Materials

- A. Hazardous Communication and Right-to-Know
- B. M.S.D.S.
- C. Reference Books
 1. CHEMTREC
 2. DOT ERG
 3. NFPA Fire Protection Guide on Hazardous Materials
 4. CROSS/CRISS/Merck

IX. Hazard Classes and Properties

- A. Flammable Liquids
 1. Identification
 2. Physical and chemical characteristics
- B. Flammable Solids
 1. Identification
 2. Physical and chemical characteristics

EXHIBIT IIE-1

C. Gases - Compressed, Liquified, and Cryogenic

- 1. Identification**
- 2. Physical and chemical characteristics**

D. Oxidizers and Organic Peroxides

- 1. Identification**
- 2. Physical and chemical characteristics**

E. Poisons

- 1. Identification**
- 2. Physical and chemical characteristics**

F. Radioactive

- 1. Identification**
- 2. Physical and chemical characteristics**

G. Corrosives

- 1. Identification**
- 2. Physical and chemical characteristics**

X Monitoring and Sampling Methods

- A. Reasons**
- B. Methods**
- C. Procedures**
- D. Equipment**
- E. Documentation and Records**

XI. Spill Control and Clean Up

A. Purpose

- 1. Contain**
- 2. Control**
- 3. Clean up**

B. Patching and Plugging

- 1. Personal protection**
- 2. Drums**
- 3. Cylinders**

C. Clean Up

- 1. Federal and State requirements**
- 2. Corporation policies**

Exhibit IIE-2

Employee Hazardous Waste Training Log

EXHIBIT IIE-2

EMPLOYEE HAZARDOUS WASTE TRAINING LOG

Employee Name: _____ **#** _____ **Hire Date:** _____

Employee Position⁽¹⁾: _____

[illegible]

(1) Reference *Table IIE-2* for employee position descriptions.

Attachment L

**Service Agreement with Compliance Services, Inc.
9/20/90**



AN ENVIRONMENTAL MANAGEMENT COMPANY

September 20, 1990

Recycling Sciences, Int.
30 South Wacker Drive, Suite 1420
Chicago, IL 60606
Attn: George Sullivan

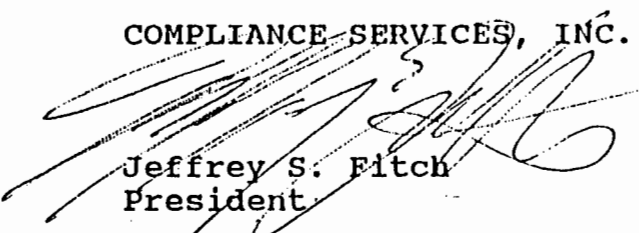
Dear Mr. Sullivan:

This is to confirm that Compliance Services, Inc. is prepared to serve as your emergency response contractor for the Marcus Hook TSD facility. Implementation of this service will be through contact of Compliance Services, Inc. at our twenty four (24) hour telephone number: (215) 254-0842.

This is to comply with requirements for Contingency Planning under Pennsylvania state and federal regulations. Our personnel are familiar with your PPC Plan and are prepared to respond in a timely fashion to incidents as well as to interface with appropriate local and state emergency management agencies.

Sincerely,

COMPLIANCE SERVICES, INC.



Jeffrey S. Fitch
President

JSF/dmw

Emergency Contacts: Marcus Hook, PA

Marcus Hook Police Department
10th and Greene St.
Marcus Hook, PA 19061
Phone: (215) 485-5881
Emergency Phone: (215) 566-2800

Marcus Hook Fire Department
8th and Market
Marcus Hook, PA 19061
Phone: (215) 485-4393

Delaware County Sheriff Department
County Court House
Media, PA
Phone: (215) 891-4296

Sacred Heart Hospital
9th and Wilson
Chester, PA 19013
Phone: (215) 494-0700

Insurance
Burchett and Assoc., Inc.
2400 W. 95th Street
Evergreen Park, IL 60642
Phone: (708)636-8787
Contact: Bill Sullivan

Attachment M

RSI Contingency Plan
7/28/92

IID CONTINGENCY PLAN (40CFR270.14(b)(7))

IID-1 Purpose and Content of Plan (40CFR264.51, 264.52(a), and 270.14(b)(7))

The purpose of RSI's Contingency Plan is to comply with 40CFR264.51 and to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water. Recycling Science International is prepared to implement the provisions of the Contingency Plan immediately whenever the above described hazards occur at the Facility.

The Contingency Plan contains the informational requirements specified in 40CFR270.14(b)(7) and demonstrates compliance with the requirements of 40CFR 264.50 through 264.56.

IID-2 General Information

Recycling Sciences International is the owner and operator of a treatment and storage system which removes TC and other hazardous waste from soils and other compatible host materials (e.g., relatively non-adsorbent, geologic sediments such as silts, sands, and gravels). The waste treatment method, patented by RSI, is called the Desorption and Vaporization Extraction (DAVE) System. The RSI system and Facility are located approximately 25 miles northwest of Tucson, Arizona, in the Avra Valley, a relatively unpopulated, rural area formerly active in the mining industry, and now utilized primarily for agriculture and small related businesses.

The Facility address and RSI's primary contact persons are listed below:

FACILITY ADDRESS:

Mr. Anthony Novelli
Director of Compliance Services
Recycling Sciences International, Inc.
16255 North Avra Valley Highway
Marana, AZ 85653
(602) 682-6806

CORPORATE OFFICE ADDRESS:

Mr. Tom Dunne
Chief Executive Officer
Recycling Sciences International, Inc.
30 South Wacker Drive
Chicago, IL 60606
(312) 559-0122

The list of wastes that will be accepted by RSI is as follows:

EPA Hazardous Waste Number	Constituent
D018	Benzene
D019	Carbon Tetrachloride
D020	Chlordane
D021	Chlorobenzene
D022	Chloroform
D023	o-Cresol
D024	m-Cresol
D025	p-Cresol
D026	Cresol
D027	1,4-Dichlorobenzene
D028	1,2-Dichloroethane
D029	1,1-Dichloroethylene
D030	2,4-Dinitrotoluene
D031	Heptachlor
D032	Hexachlorobenzene
D033	Hexachlorobutadiene
D034	Hexachloroethane
D035	Methyl ethyl ketone
D036	Nitrobenzene
D037	Pentachlorophenol
D038	Pyridine
D039	Tetrachloroethylene
D040	Trichloroethylene
D041	2,4,5-Trichlorophenol

IID-3 Emergency Coordinators (40CFR264.52(d) and 264.55)

Table IID-1 identifies RSI's designated Emergency Coordinator (EC) for the Facility. Also identified are alternates who are authorized to serve as EC, in the event that the designated individual is unavailable to respond. Deputy Coordinators are listed in the order in which they are authorized to assume responsibility.

TABLE IID-1. EMERGENCY COORDINATORS

Name	Title	Home Address	Work Phone	Home Phone
Anthony Novelli	Director of Compliance and Health & Safety	4531 Cam. De La Puerta #19 Tucson, AZ 85718	(602) 682-6806 (602) 744-1951	(602) 577-2897

NOTE: As additional personnel are trained in their respective roles, this list of Coordinators will be updated and distributed

When the EC responds to an accidental release, fire or explosion involving hazardous waste he is responsible for quickly assessing the situation and instituting timely response measures to control the emergency and to protect human health and/or the environment.

The EC has the authority to commit RSI's available resources to carry out this Contingency Plan. The EC's responsibilities during implementation of the Contingency Plan are outlined in *Figure IID-1*. A more general description of emergency response guidelines are presented in *Figure IID-2*. Section IID-5 of this Plan details the specific actions to be performed by Facility personnel during site emergencies.

IID-4 Implementation (40CFR264.52(a) and 264.56(d))

The Contingency Plan will be implemented immediately if an accidental fire, explosion, or release of hazardous waste or hazardous waste constituents occurs at the RSI Facility which threatens, or could potentially threaten, human health or the environment.

The EC will immediately assess any such situation (or potential emergencies) and determine if the Contingency Plan should be implemented. The decision on whether to implement this Plan will depend on the EC's assessment of several factors:

- The type and quantity of wastes and other materials involved
- The potential for the spread of fire or the initiation of an explosion
- The available capability to respond to and control the situation.

FIGURE IID-1
Emergency Coordinator Responsibility Summary

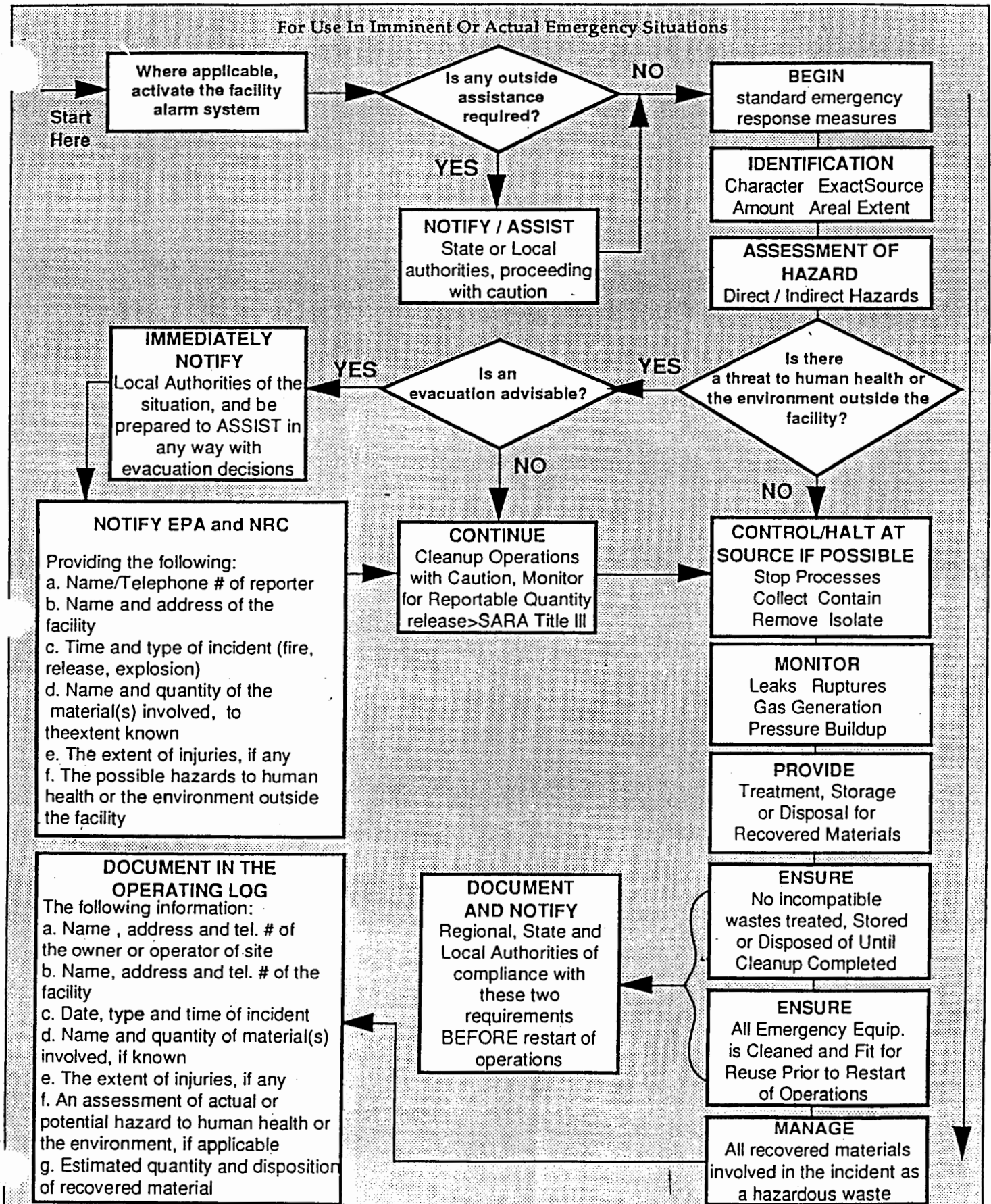
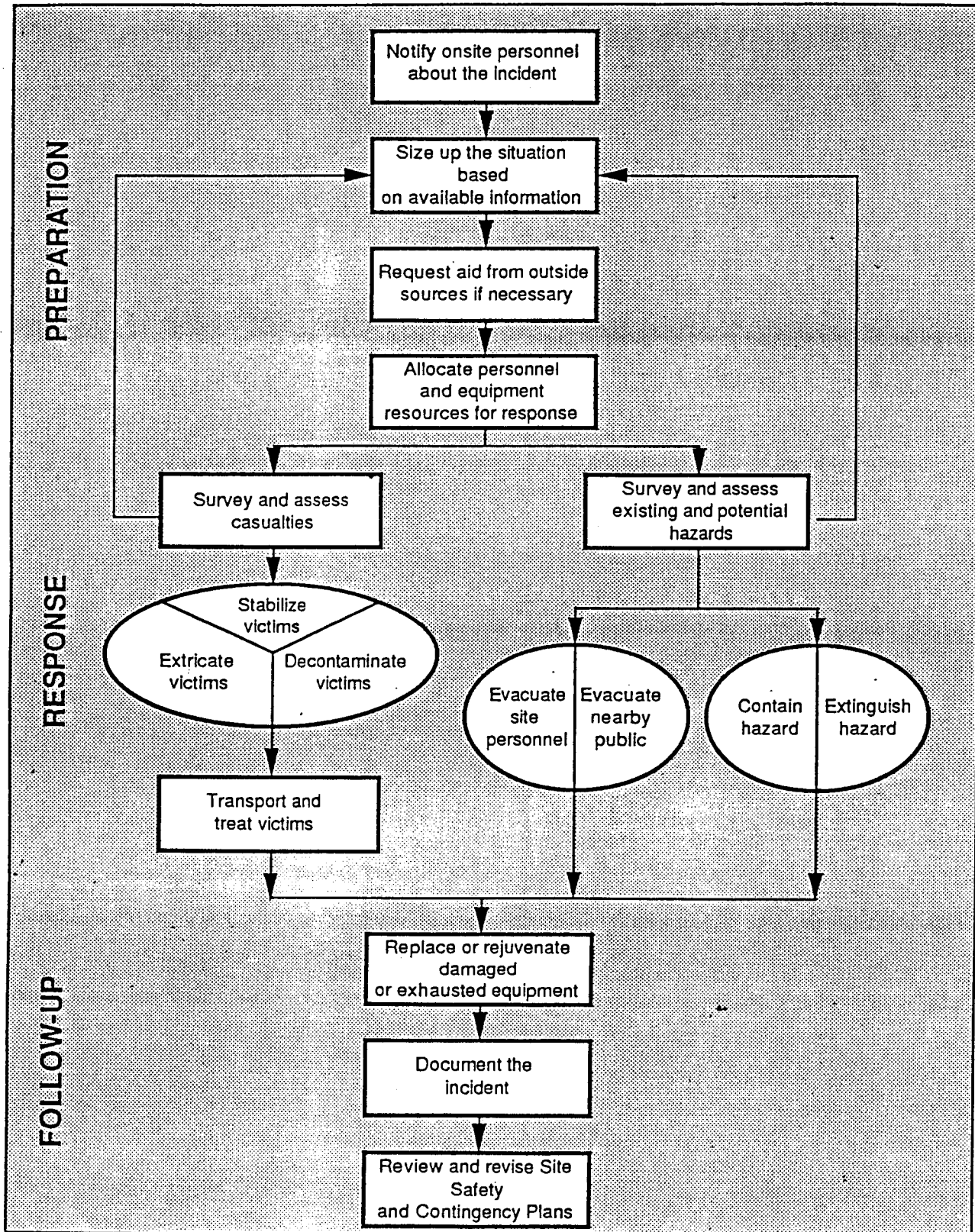


FIGURE IID-2
Emergency Response Guidelines



Source: Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities - 1985

This Contingency Plan will be implemented whenever the EC determines that an imminent or actual emergency could threaten human health or the environment outside the Facility. The potential situations that could result in the implementation of the plan are:

Fires and/or Explosions

- A fire causes the release of toxic fumes.
- A fire spreads or could possibly ignite materials at other locations on-site, or could cause heat-induced explosions.
- An electrical shock hazard exists, or an injury, fire, explosion, or release is imminent, or has occurred due to electrical discharge.
- An imminent danger exists that an explosion could occur.
- An explosion has occurred.

Spills, Material or Vapor Releases

- A spill has occurred resulting in the release of hazardous, toxic, corrosive or reactive wastes or waste constituents to the environment.
- An operational or mechanical system failure could cause the release of hazardous wastes, or hazardous waste constituents to the environment.

IID-5 Emergency Response Procedures (40CFR264.56)

Following is an outline of the procedures and rationale used by the EC and RSI employees in the event that implementation of this Contingency Plan becomes necessary. *Figure IID-2* also is included to assist in the clarification of the decision-making process used in an emergency.

IID-5.a Notification (40CFR264.56(a))

Emergencies are to be reported immediately to the EC via telephone or two-way radio. If EC's line is busy or he does not answer promptly, RSI personnel will attempt to contact the Deputy Coordinator. If the Deputy Coordinator cannot be reached, the emergency will be reported to the plant office manager.

When an emergency occurs, reporting personnel will provide the following information:

- Caller's name
- The telephone extension and/or location from which the call is being made
- The nature of the emergency (spill, fire, etc.)
- The exact location of the emergency
- If any injuries have occurred, a description of the injuries and location of injured personnel.

The EC will immediately notify the appropriate plant personnel of the emergency and its location using the Facility's public address system. Signaling alarm devices (air-horns, beacons or a siren) will be used to alert personnel in the affected area and for summoning emergency units. The signal for evacuation will be three long blasts on the air horn at fifteen second intervals. Red warning lights also will be flashed to alert employees that cannot hear the evacuation announcement. At the location of emergency, notification also will be transmitted verbally, where possible, in and around the building of concern.

In case of failure of verbal or radio communications, the following standard hand signals will be used by RSI personnel:

Hand gripping throat	Out of air, can't breathe
Grip partner's wrist or both hands around waist	Leave area immediately
Hands on top of head	Need assistance
Thumbs up	OK, I am all right, I understand
Thumbs down	No, negative.

The public address system, along with direct verbal communication from shift supervisors, will be used to signal the end of the emergency and a return to normal operations.

The EC will assess the situation, direct response activities, order any necessary evacuations, and, if needed, contact outside authorities for assistance.

Table IID-2 lists the outside authorities that can provide support services in the event of an emergency. In the event of a release of a reportable quantity of a hazardous substance, the EC will immediately notify the National Response Center (NRC). If a release, fire or explosion that could threaten human health or the environment occurs, ADEQ also will be notified immediately. The EC will assist outside authorities in evaluating the necessity of public evacuation outside the Facility.

IID-5.b Identification of Hazardous Wastes (40CFR264.56(b))

The EC will visually identify the material, source, amount and the areal extent of any release. For ease of identification, containers are labeled by contents and are stored by waste category in separate locations. An up-to-date container storage inventory identifying each container is kept by the Plant Manager to aid the EC in identification of hazardous wastes. During a release, normal markings may become indistinguishable. In this situation, basic chemical analyses such as pH, organic vapor, other gas detection, or other general test methods readily available will be used by the EC and the Chemical Design Engineer to make the necessary identifications.

Table IID-3 summarizes emergency reporting requirements. Also attached in *Exhibit IID-7* is a copy of the emergency phone directory that is posted near each telephone at the Facility.

TABLE IID-2. OFF-SITE EMERGENCY CONTACTS

Emergency	Organization or Agency	Emergency Telephone No.
ALL INCIDENTS		Dial 911
<u>Other Contact Info:</u>		
EMS	Northwest Hospital	(602) 742-9000
	Poison Control Center	(800) 362-0101
	Dept. Emergency Services	(602) 741-4809
Fire	Avra Valley Fire Department	(602) 682-3255
	Picture Rocks Fire Department	(602) 682-7878
	Northwest Fire District	(602) 742-4749
Hazardous Material	Arizona Dept. Environmental Quality Office of Emergency Response	(602) 257-2342
	EPA Region IX Response Center	(415) 974-8131
	Environmental Emergencies (24 hours/day)	(415) 974-7511 (415) 424-8802
Law Enforcement	Pima County Sheriff - Marana	(602) 741-4600
	Department of Public Safety	(602) 586-3947

HOSPITAL ROUTE: Northwest Hospital: East 11 miles on Avra Valley Rd. to I-10 East. Proceed to 5 miles to Orange Grove Road East, 3 miles to La Cholla Blvd. Go South 3 blocks to Hospital. Approximate time to hospital: 25 minutes.

TABLE IID-3. GOVERNMENTAL AGENCY NOTIFICATION REQUIREMENTS

Condition	Agency	Time Limit
Release, fire, or explosion could threaten human health or the environment	ADEQ	Immediate
Release of a reportable quantity of CERCLA material	NRC	Immediate
Before resuming operations after any implementation of the contingency plan	ADEQ	Before operations are resumed
Written report on any incident causing implementation of the contingency plan	EPA/ADEQ	15 days
Arizona Department of Environmental Quality (ADEQ)	(602) 257-2330	
National Response Center (NRC)	(800) 424-8802	
Address for written responses: Carl F. Funk, Executive Director Arizona Response Commission 5636 East McDowell Road Phoenix, Arizona 85008 Non-emergency phone number: (602) 231-6326		

IID-5.c Hazards Assessment (40CFR264.56(c) and (d))

The EC will assess possible hazards, both direct and indirect, to human health or the environment.

Direct hazards are those resulting from exposure to hazardous wastes, fires or explosions. Indirect hazards are those resulting from actions taken to control a spill or fire, or from interaction between the hazardous waste and plant equipment or material.

The EC will use professional experience, Material Safety Data Sheets, manifests, waste profile documentation, and other information sources to assess the possible hazards to human health and the environment resulting from a fire, release, or explosion.

The EC also will assess the need to evacuate the area and to notify appropriate authorities, as listed in *Table IID-2*. If there are any doubts regarding the need for evacuation, the EC will take the necessary steps to erase those doubts, or he will proceed with evacuation.

IID-5.d Injury or Accident to RSI Personnel or Visitors

Potential injuries to employees or visitors fall into three general classifications:

- Physical trauma common to industrial workplaces (i.e., falls, burns, cuts etc.)
- Short- or long-term exposure to hazardous materials, or oxygen deprived environments (i.e., confined spaces)
- Accidents involving combinations of the both exposure and physical trauma.

The DAVE System is designed to minimize the risks associated with handling hazardous materials. Locally contracted Occupational Physicians and Industrial Hygienists are on call to RSI in case of emergency, and to administer an ongoing medical monitoring program for RSI employees.

Recycling Sciences International has developed a direct two-way communications link with local emergency response teams, that will allow RSI to have access to emergency response communications in the event of power or phone failure. This will provide a direct link with members of Pima County Incident Command System (PCICS), and will allow RSI to provide continually updated information on incident evaluation, casualty reports, and anticipated manpower/equipment needs. For more information on this regional response system, see Section IID-7.

The EC, in conjunction with Emergency Medical Service professionals, will be responsible for ascertaining whether or not an injury to an employee or visitor requires medical treatment beyond first aid administered on site. For injuries requiring prompt medical treatment, the EC, or other qualified personnel, will provide emergency first aid to the extent possible, consistent with the overall objective of transporting the injured individual to a medical facility as quickly as possible. Transportation of injured

persons to the medical treatment facility may be by an available on-site vehicle, or by ambulance, at the discretion of the EC.

IID-5.e Emergency Decontamination

In an emergency, RSI's primary concern will be to prevent the loss of life or injury to site personnel. If immediate medical treatment is required to save a life, decontamination will be delayed until the victim has been stabilized. If decontamination can be performed without interfering with essential life-saving techniques or first aid, or if a worker has been contaminated with an extremely toxic or corrosive material that could cause severe injury or loss of life, decontamination must be performed immediately.

If a heat-related illness develops, protective clothing will be removed from the victim as soon as possible to reduce the heat stress. Due to climatic considerations, RSI personnel will be closely monitored for heat-stress symptoms, and provided sufficient hydration while working on site.

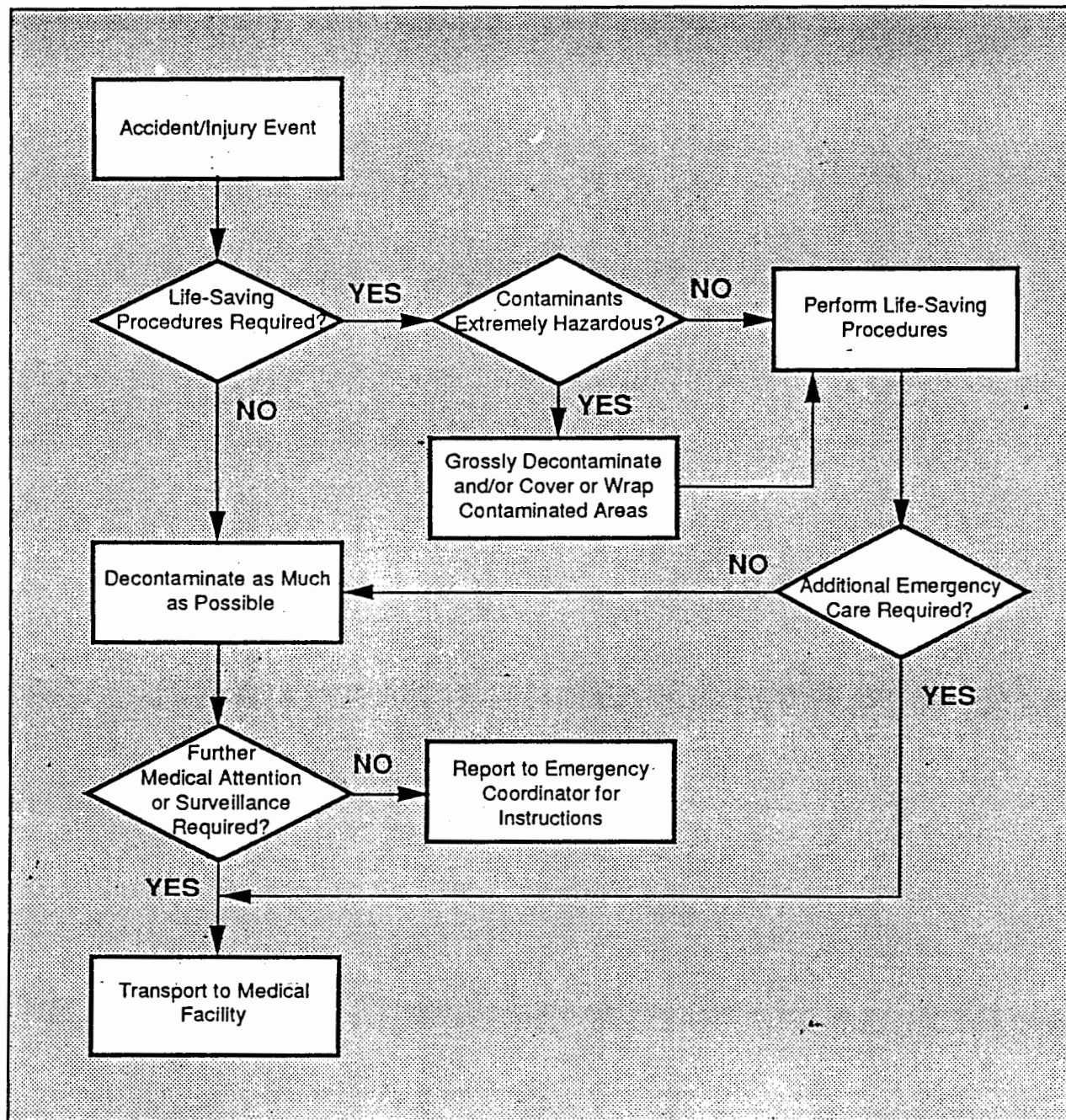
During an emergency, provisions will be made for the protection of medical personnel, their equipment, vehicles and the disposal of contaminated clothing and equipment. An outline is provided in *Figure IID-3* to aid and clarify the decision making process in the event of a need for emergency decontamination.

IID-5.f Control Procedures (40CFR264.52(a))

Accidents which could potentially impact human health or the environment outside the Facility fall under three general classifications:

- fire and/or explosions
- spills or material release
- hazardous vapor release.

FIGURE IID-3
Decision Aid for Emergency Decontamination



Source: Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities - 1985

Fires and Explosions

The local fire department is familiar with the operations and corresponding risks associated with the RSI Facility. This department shall be informed of the known hazards and conditions existing at the scene, via two-way radio or telephone before they arrive on site, and before they are allowed to approach the fire. That is, when a fire is discovered, one messenger shall be dispatched to telephone or radio the EC, who will then call the local fire department. The messenger will go to the Facility entrance from which the fire department is expected to approach, and will be prepared to escort incoming manpower and equipment to the incident site. The EC will then provide continual evaluation and staging information to the incoming fire units by two-way radio until their arrival.

Workers must not approach or fight any fire while wearing clothing that is not fire repellent or resistant. Tyvek® or Saranex coveralls are types of clothing which have a very low melting point. These employees must evacuate or remove this clothing as soon as possible in the event of a fire or explosion.

In case of fire, the EC will be notified immediately, and will determine if fire-fighting efforts can take place safely with RSI's fire-suppression and personal protective equipment.

1. Initial efforts will always concentrate on accounting for all personnel believed to be on-site, and in the affected area. Search and rescue activities will be a higher priority than fire fighting or damage control efforts.
2. After all personnel have been accounted for, the EC, or his authorized representative, will arrange for first aid or medical treatment for injured personnel, as required.
3. Project personnel will utilize fire extinguishers and other emergency equipment provided at the work site until Avra Valley Fire District personnel arrive. The EC is the individual with primary responsibility for requesting emergency assistance from the nearest local jurisdiction.
4. The EC will work closely with local authorities to prevent the possible spread of contamination. Steps taken will include:

- a. Containment of fire fighting water or other liquids through construction of temporary berms or trenches. All liquids collected would be managed as directed by the EC;
- b. In the event of fire-related releases or potential releases of vapors, all personnel remaining in the immediate vicinity of the fire will don full-face respirators. Other personnel also will don protective face masks and evacuate the area; and
- c. Access to any portions of the treatment zone not directly impacted by the fire or fire fighting efforts will be restricted to prevent exposure to contamination by persons not having appropriate protective clothing and to prevent the possible spread of contamination to other areas.

Spills or Material Release

Following are the types of potentially hazardous materials that are expected at the Facility:

- Small quantities of lubricating oil, grease and hydraulic fluid used on equipment at the site; Liquid propane gas, diesel or gasoline type fuels, for operation of site equipment.
- Waste water from the decontamination units used on the site; This water will be collected by a sump in the decontamination area, and pumped into the process water treatment section of the DAVE System.
- Process water from the DAVE System; The DAVE System is a closed-loop system which recycles treated waste water within the process for re-use. The DAVE System is placed on a concrete pad constructed with a surrounding containment berm, minimizing the risk of process water being released to the environment.
- Contaminated soils stored in containers (i.e., drums, trailers, rollofs, or bins) awaiting treatment, as well as treated non-hazardous soils or fines stored in similar containment and managed with similar handling methods.

In the event of a hazardous waste spill or release, the following general procedures will be used for rapid and safe response and control.

If an employee discovers a release, he or she will immediately report to the EC. The EC will seek information pertaining to the following:

1. The material(s) spilled or released
2. Location of the release or spillage of hazardous material
3. An estimate of quantity, rate, and direction of release
4. Any injuries involved
5. Fire and/or explosion or possibility of these events.

The information collected will help the EC to assess the magnitude and potential seriousness of the spill or release. Medical help will be obtained for injured personnel. Initial efforts will be focused on the cessation of the release, followed by containment measures to protect the environment.

Cleanup of spills will be performed by RSI employees if at all possible, or a cleanup and removal contractor will be arranged. The EC will contact and assign plant employees to cleanup the material by the use of earth moving equipment, shoveling, sweeping, use of a squeegee, pump, or vacuum fitted with the proper exhaust filters. All compatible, treatable materials will be labeled and stored in 55 gal. drums for analysis and treatment. Incompatible or untreatable wastes will be stored separately for analysis, properly labeled and, if necessary, sent off-site for recycling or disposal.

The EC will be responsible for the supervision of cleanup activities, making sure the proper protective clothing and work practices are selected, and documenting the flow and effectiveness of the operation. The EC will file appropriate reports and documentation regarding the release and cleanup activities.

All equipment used in cleanup operations will be decontaminated after use, or placed in 55-gallon drums for subsequent disposal. For flammable liquid or process water spills, the following guidelines will be followed:

1. Mitigate the release at the source, if at all possible.

2. If flammable wastes are involved, remove all ignition sources (suspending treatment operations if required), and use spark-proof equipment in containment and cleanup.
3. Contain the release by construction or placement of dikes, berms, or other barriers as appropriate to contain and minimize the area of visual contamination, as determined by the EC.
4. The EC will identify any areas to be cordoned off by using yellow tape, floor signs or a rope supported by stakes.
5. Ensure that all unnecessary persons are removed or directed away from the hazard area, utilizing Site Security where necessary.
6. Conduct emergency excavation and cleanup actions deemed necessary to protect the environment.
7. Notify appropriate authorities as required by State, Federal or local laws.
8. Photograph the area of release, logging the time, date, location and name of photographer.
9. Place recovered wastes and all containment and cleanup materials in EPA/DOT containers for proper decontamination, treatment, or disposal.
10. Emergency equipment used in the operation must be cleaned or replaced, and fit for use prior to resumption of plant operations in the affected areas.
11. Generate and submit required reports and documentation.
12. With regulatory approval, develop and implement a site-specific remediation plan where required.

Release of Hazardous Vapors

The RSI DAVE System employs a redundant process gas filtration process. Monitors operating in the carbon absorption section of the DAVE gas phase system trigger automatic shut-down, and immediate recycling of vented air. Utilization of those safety systems minimizes the risk of the release of hazardous vapors.

In the unlikely event that such an incident should occur, all initial efforts will be focused on the cessation of the release, and containment where possible by the shut-down of

ventilation systems and processing equipment. If necessary, emergency shut-down procedures will be followed, as outlined in the site Standard Operating Procedures (SOP) (*Exhibit IIA-17a*).

Notification of the necessary authorities will be directed by the EC immediately following control and containment. This notification will represent the EC's best judgment as to the amount and character of the release, and the possibility of health or environmental hazards.

Personnel in the affected area not already required to be wearing protective face masks and respirators, or supplied air breathing apparatus, will be required to don protective face masks and evacuate the area. Care will be taken to ensure that all site personnel can be accounted for before completely evacuating the area. Evacuation procedures are described in the Evacuation Plan, included in this Contingency Plan.

Wind direction and speed will be monitored on a routine basis at the project site as part of the monitoring efforts under this Contingency Plan. The EC or a designated alternate will be responsible for determining wind direction and planning evacuation routes and rallying points accordingly, to remove personnel from possible hazardous exposures.

IID-5.g Emergency Shut-down Procedures (40CFR264.56(f))

Site emergencies may require emergency shut-down of the DAVE System, and partial or total evacuation of personnel. Shut-down procedures to be followed for the DAVE System during such events are outlined in the SOP.

In the event of an emergency shut-down, the acting EC or his authorized representative will monitor for leaks, pressure buildup, gas generation or ruptures in valves, pipes, or other equipment wherever such monitoring is appropriate.

Recycling Sciences International operating personnel will be formally trained in emergency shut-down procedures. Emergency shutdown drills will be performed at the site.

IID-5.h Post-emergency Cleanup Assessment

After an emergency cleanup has been accomplished, the EC will examine the subject area for damage or residues. The area will be cordoned off to restrict traffic, until the assessment has been completed and the EC decides that it is appropriate to open the area for future traffic. If the spill or release of hazardous materials has occurred within the lined, bermed areas designated for hazardous waste management, the following general guidelines will be adhered to:

- The EC will collect a sample of the cleaned surface for laboratory analysis to evaluate the condition of the soil.
- If laboratory results indicate that the surface is contaminated, a remedial action plan would be developed and implemented with appropriate state, local and federal approval, to define, remove and dispose of the contaminated material.

If the spill or release has occurred in an area of the Facility that is unprotected and generally used for hazardous waste management, the following general guidelines would be followed:

1. After preliminary cleanup activities have been successfully completed, the EC will examine the area of the release for visible residues, taking into account wind direction, the length of time the material was in contact with the soil, the gradient, and the properties of the material released.
2. Remaining residues would be excavated or collected, and stored in EPA/DOT approved containers.
3. Appropriate authorities will be notified of the release as required by State, Federal or local laws.
4. The area will be cordoned off with temporary markers, using either yellow tape or a rope supported by stakes.
5. The area of release will be photographed, and the time, date, location and name of recorder will be logged.
6. Where necessary, a remedial action plan would be developed and implemented to define, remove and dispose of contaminated material that may remain.

7. Required notification and document filing requirements will be followed, as stated in this Plan.

Details of RSI's methods of waste characterization are presented in the Waste Analysis and Sampling Plan.

IID-5.i Prevention of Recurrence or Spread of Fires, Explosions, or Releases (40CFR264.56(e))

If a fire or explosion should occur inside a building, all operations in that area would be stopped and buildings would be closed and vacated. The EC would assess whether it is possible to prevent the spread of fire or explosions by removing combustible or flammable materials from the area.

After the emergency is under control, the EC, along with other appropriate plant personnel, will identify the cause of the emergency. Appropriate measures will be evaluated and implemented to prevent the recurrence of a similar emergency. In addition, RSI's Contingency Plan would be reviewed and/or revised as necessary.

IID-5.j Storage, Treatment, and Disposal of Released Materials (40CFR264.56(g))

Immediately after an emergency, the EC will make appropriate arrangements for treatment, storage, or disposal of recovered waste, contaminated soil, surface water, or any other contaminated material that might have been generated as a result of the emergency. All materials compatible with the DAVE extraction system will be treated on-site. Other wastes will be disposed off-site at appropriate locations.

IID-5.k Incompatible Wastes (40CFR264.56(h)(1))

The EC will take appropriate measures to ensure that incompatible materials are not stored, treated, or disposed of until cleanup of the released materials is complete. These measures may include suspending DAVE system processing or material handling operations, and isolating incompatible materials away from the released materials.

IID-5.1 Post-emergency Equipment Maintenance (40CFR264.56(h)(2))

After an emergency, all safety and emergency equipment used during that event will be cleaned so that it is fit for its intended use, or it will be replaced. Before operations are resumed, the availability of safety and emergency equipment will be verified by the Coordinator. Arizona Department of Environmental Quality will be notified that post-emergency equipment maintenance has been performed and operations will be resumed.

IID-5.m Container Spills and Leakage (40CFR264.52(b) and 264.171)

If the spill is not contained within a concrete pad or walkway, an area of isolation will be established around the spill. The size of the area will depend on the size of the spill and the nature of the materials involved. If any spill occurs, only those persons involved in overseeing or performing emergency operations will be allowed within the designated hazard area. If necessary, the area will be cordoned off, or barricaded by other suitable means.

If the spill results in the formation of hazardous vapors by reaction with surrounding materials, or by outbreak of fire, further evacuation may be directed by the EC.

If deemed safe by the EC, emergency response personnel will implement absorption procedures, collecting the spilled material and placing it in compatible containers.

If leaks are detected in the DAVE System, or in any of the associated piping, the EC will be contacted immediately and will determine, with the assistance of the DAVE System operators:

1. Whether the leaking material is or might be a hazardous waste.
2. If the material is suspected of being a hazardous waste, the EC will prescribe the cleanup and repair actions necessary.
3. If the material is known to be non-hazardous, the EC will note the leak in the operating log, and record the estimated time of repair as related by RSI. Completion of those repairs will be documented.

If leaking containers are identified during a response to an emergency or during a routine inspection, the EC will be promptly notified. The material from the leaking container will either be transferred to a new container or the entire leaking container will be placed in an overpack drum, and the materials that have leaked will be handled appropriately.

IID-5.n Tank Spills and Leakage (40CFR264.194)

The Facility does not manage hazardous wastes in tanks.

IID-5.o Surface Impoundment Spills and Leakage (40CFR264.277)

The Facility does not manage hazardous wastes in surface impoundments.

IID-6 Emergency Equipment (40CFR264.52(e))

Emergency spill control equipment for use in containing and removal of spilled hazardous liquid wastes such as, lubricants, solvents or fuels, is stored at strategic locations around the Facility. This equipment includes absorbent, floor squeegees, shovels, brooms, and 55-gallon drums. Shovels, brooms and drums for cleaning up spilled wastes are also available in the storage area.

Personal protective equipment including respirators, chemical resistant gloves, face shields, protective boots and Tyvek® chemical resistant overalls are readily accessible in the safety equipment storage area.

Additionally, fire control equipment is located throughout the Facility.

Table IID-4 lists emergency response and spill control equipment; a description of the use and capabilities of this equipment is presented in *Exhibit IID-3*. The locations of this equipment are shown on *Exhibit IID-4*.

IID-7 Coordination Agreements (40CFR264.37 and 264.52(c))

Recycling Sciences International's Facility is located in Pima County, within the jurisdiction of the PCICS. This system is accessed by dialing 911 which automatically

TABLE IID-4. EMERGENCY RESPONSE AND SPILL CONTROL EQUIPMENT

Equipment	Quantity	Location(s)
<u>Facility Safety Equipment</u>		
Eye wash station	3	Entire plant
First aid kits	2	Entire plant
Fire blanket	2	Entire plant
Wind sock	2	TBA ⁽¹⁾
Emergency shower/Eyewash station	1	TBA ⁽¹⁾
Fire Extinguishers (Halon)	7	Entire plant
Fire Extinguishers (ABC)	7	Entire plant
Fire Extinguishers (ABC)	2	Storage Areas
<u>Personal Protective Equipment</u>		
Saranex/Tyvek® coveralls	20	Safety Storage
Gloves, Viton	8	Safety Storage
Gloves, Disposable emerg. response	48	Safety Storage
Emergency escape 10-min breather	2	Safety Storage
Full face respirators	8	Safety Storage
Respirator filter canisters	64	Safety Storage
Prefilters	24	Safety Storage
Chemical resistant work boots	8	Safety Storage
Hard hats	12	Safety Storage
Face shields	24	Safety Storage
<u>Spill Containment & Emergency Response</u>		
55 Gallon Drums	10	Treatment Area
Absorbent materials (large pads)	1 case	Safety Storage
Absorbent materials (booms)	1 case	Safety Storage
Shovels, brooms, squeegees	4 each	Entire plant
<u>Monitoring Devices</u>		
Dosimeter	1	Safety Storage
Indicator tubes	4 boxes	Safety Storage
Noise meter	1	Safety Storage
Oxygen, LEL meters	2	Safety Storage
Combustible gas detector	1	Safety Storage

NOTE: ⁽¹⁾ To be added during Phase I construction

triggers the following:

- Specific information is collected on the nature and severity of the incident, materials involved, and RSI contact personnel at the Facility.
- Police, Fire, Medical, Hazardous Materials or State Emergency Response authorities are dispatched as needed to respond to the incident.
- The incident is monitored by PCICS to insure adequate coverage during escalation, or de-escalation of the incident.
- Jurisdictional decisions are handled within the structure of the PCICS. The responsibility for deciding which department or agency is charged with authority, is part of the function of the PCICS.
- Within the PCICS format are specifically designed standard operating procedures for the handling of emergency response operations. RSI continues to develop response guidelines with PCICS representatives as is needed to ensure open communication, and comprehensive safety to protect human health and the environment.

Recycling Sciences International's communications with PCICS include arrangements to familiarize response teams with the layout of the Facility, properties of hazardous waste handled at the Facility and associated hazards, places where Facility personnel normally would be working, entrances to roads within the Facility, and possible evacuation routes.

Additional arrangements are designed to familiarize local hospitals with the properties of hazardous waste handled at the Facility, and the types of injuries or illnesses which could result from fires, explosions, releases or accidents at the Facility.

Exhibit IID-5 contains a copy of the present Standard Operating Procedures outlined by Avra Valley Fire Department (AVFD), that apply to the Facility. Also included is a letter of confirmation for services provided.

IID-8 Evacuation Plan (40CFR264.52(f))

The RSI Facility's evacuation plan is designed to respond to potential emergencies that could result from a fire, explosion, or release of hazardous wastes. However, due to the small quantities, low ignitability potential, and the physical characteristics of the

materials involved, waste, fuel or solvent spills, evacuation of the Facility should never be required.

Employees will be warned of a required evacuation using the Facility public address system or signaling alarm devices (air horns, beacons and a siren). The location of the problem area will be transmitted immediately to appropriate management personnel by telephone or portable radio.

Employees will be instructed to take the following actions during an emergency:

1. Remain where you are if reasonably safe.
2. If necessary, seek best available shelter.
3. In all events, do not go to the scene of the emergency unless you have previously been assigned specific duties.
4. If you have received such assignments, proceed to carry them out. Pay due regard for your safety.
5. If there is time, shut down operations according to SOP.
6. Remain on the job at your work place, if possible, making things as secure as possible under the standard procedures for your job. You will be given further instructions by your supervisor as soon as possible.
7. If your services are not needed at the Facility, you will be released from duty by a department supervisor prior to, or at the end of your normal shift.
8. If you are off duty, do not rush to the Facility unless your help is requested. Remain at home near your telephone but do not call into the site, as this may interfere with necessary outgoing calls. If you do not have a telephone and wish to help, come to the site but remain outside the gate until your help is requested.
9. Do not tie up RSI telephone lines into or out of the site. The line may be needed to summon help, as a life may depend on this service.

If evacuation is necessary, personnel will be instructed to follow the prescribed evacuation routes shown on *Exhibit IID-2*.

In the event an incident occurs which could threaten human health or the environment outside the Facility, RSI's EC will work closely with PCICS representatives to ensure an evacuation procedure is implemented which protects public safety. Implementation and decision-making responsibilities for the evacuation of local areas fall within the PCICS jurisdiction.

Considerations in the design of this response plan include wind speed and direction, the nature and amount of contaminants released, and the proximity to sensitive local receptors, such as schools, businesses or residential areas.

IID-9 Required Reports (40CFR264.56(i) and (j))

Any emergency event (e.g., fire, explosion, etc.) that requires implementation of the contingency plan will be reported in writing to the EPA Region IX and ADEQ's Office of Emergency Response and Environmental Analysis within 15 days.

Recycling Sciences International's emergency reporting form is provided as *Exhibit IID-6*.

IID-10 Copies of Plan (40CFR264.53 and 270.14(b)(7))

Current copies of this Contingency Plan are retained at the Facility and have been submitted to the PCICS, Northwest Hospital in Tucson, Pima County Sheriff's Department, and Arizona Response Commission.

Additionally, a copy of this Plan, and other RSI documentation, may be requested by the public. These requests, or any questions, comments, or suggestions, will be encouraged by RSI, and responded to as quickly as possible by RSI personnel.

IID-11 Amendment of Plan (40CFR264.53)

This Contingency Plan will be reviewed at least semi-annually, and amended, if necessary, whenever any or all of the following occurs at RSI's Facility:

1. Applicable regulations are revised
2. The Plan fails during an emergency
3. The Facility changes the design, construction, operation, maintenance, or other circumstances in a way that materially increases the potential for fires, explosions, or releases of hazardous waste or its constituents, or changes the response methods used by RSI or other emergency response personnel
4. The list of ECs changes
5. The list of emergency equipment changes.

Attachment N

**RSI Closure Plan with Financial Assurance
1/14/92**

SECTION F

CLOSURE PLAN AND FINANCIAL REQUIREMENTS

This section is submitted in accordance with 40 CFR 265.110(a) and addresses the regulatory requirements of §§ 265.111 through 265.115, 265.142, 265.143, and 265.147.

Recycling Sciences International, Inc. (RSI) Closure Plan, contained in this section, describes all the actions necessary to close operations, and the costs to complete these actions. Also included is Financial Assurance for implementing closure, and a copy of RSI's liability insurance policy.

F-1 Closure Plan [§ 265.110 (a)]

F-1a Closure Performance Standard [§ 265.111 (a), (b)]

The planned closure of the RSI facility involves the removal and disposal of all hazardous waste and hazardous waste residues at the time of closure. Because only soils contaminated with hazardous waste are managed in containers at this facility, the opportunity for hazardous wastes to enter the environment is minimal, and are easily contained in case of accidental spillage. This allows RSI to be confident that all closure actions outlined in this plan will ensure that only minimal, if any, maintenance activities will be required in the event of closure.

F-1b Partial and Final Closure Activities [§ 265.112(b)(1)]

The hazardous waste management units employed at RSI's facility fall under two categories: Storage and Treatment.

Storage: The hazardous wastes that will be stored by RSI at the facility will only compromise enough soils to ensure smooth feed operations, and prevent operational delays due to analysis lag times and inconsistent waste availability. All wastes being stored on site will be containerized. Closure of these units would proceed as follows:

1. Contaminated soils in storage would be treated through the DAVES system, and captured in clean hoppers or trailers after processing.
2. All treated soils would be sampled in accordance with standard sampling and analysis procedures outlined in RSI's Waste Analysis Plan. These soils would then be shipped off site, once clean up criteria had been satisfied.
3. All storage containers would be decontaminated by the use of a steam generating pressure washer. All decontamination liquids would be captured and pumped into the DAVES water treatment section for processing.
4. After decontamination, all vehicles and equipment will be moved off site.

Treatment: RSI's treatment unit is a low temperature thermal desorption unit, which operates on solids (i.e. soils, sludges, silts etc.) contaminated with various hydrocarbon based compounds. The unit is technically referred to as RSI's Desorption And Vapor Extraction (DAVE) System. The DAVE system is designed with redundant emissions and operational safeguards, minimizing the opportunity for the escape of hazardous waste, or hazardous waste constituents. Closure of the unit would be accomplished by following the protocol listed below:

1. Process the remaining hazardous waste inventory and any other soils found to be contaminated with hazardous waste residues found during determinations discussed in F-1e below.
2. Purge system of contaminated soils by operating on clean feed.
3. Decontaminate feed and extractor system components by the use of a steam generating pressure washer.
4. Steam clean all vehicles and equipment in decontamination area. Any equipment not readily decontaminated, such as respirator filter canisters, will be placed in approved 55 gallon drums for off site disposal.
5. Collect and pump all decontamination liquid into the DAVES water treatment section. Collect all rinsewater generated in the washing of the processing area floors and equipment.
6. Operate DAVES water treatment section until all process and decontamination water is safe for discharge, and water treatment components are backwashed into the carbon filters.
7. Empty carbon filter media into approved steel 55 gallon drums for analysis, and if necessary, off site disposal.
8. Demobilize and move off site all DAVES system componentry.

F-1c Final Closure [§ 265.112 (b)(2)]

Final closure will be conducted as outlined in F-1b above. No partial closure activities will be undertaken at the RSI facility. The maximum extent of the operation that will be unclosed is the entire facility, which constitutes the treatment and storage units listed above.

F-1d Maximum Inventory of Hazardous Wastes [§ 265.112 (b)(3)]

The maximum inventory anticipated of hazardous waste at any one time at the facility is approximately 3300 tons, though average operating requirements will probably be sufficiently met with around 1000 tons.

No partial closure activities will be undertaken, and final closure will follow the protocol outlined in F-1b above.

The disposal contractors which may be used by RSI in the event of closure are listed in Exhibit F-1.

F-1e Decontamination and Removal Procedures [§ 265.112 (b)(4)]

The decontamination and removal of RSI equipment is outlined above in section F-1b. Determination of whether hazardous waste residues exist will be done as follows:

1. Wipe samples will be taken of the concrete pad(s) in areas of highest traffic.
2. A grid will be laid out in the contaminated soils storage area, and areas where hazardous waste movements occurred.
3. Shallow cores of soil from the sampling points outlined on the grid will be collected in a clean container.
4. Collected soils will then be mixed, in order to obtain acceptable homogeneity. A sample(s) will be drawn of this composite mixture and sent to the laboratory for analysis.
5. Sampling area and protocol will be recorded and photographed.
6. Soils collected for analysis will be retained in an approved, sealed 55 gallon drum until analysis results determine the soils free of residue.

If any hazardous waste residues are detected above acceptable levels, the sampling data will be reviewed and the area(s) excavated to a shallow depth. Soils will be collected and processed through the DAVE system, and the above mentioned sampling protocol and subsequent treatment will be repeated until all residues are removed to below acceptable levels.

F-1f Schedule for Closure [§ 265.112(b)(6)]

The anticipated time periods required for the completion of closure activities are outlined in Table F-2.

F-1g Expected Date of Closure [§ 265.112(b)(7)]

RSI plans to operate it's facility until the availability of contaminated soils suitable for treatment with the DAVES becomes exhausted. Considering the extent of environmental contamination present, no date can be set for the expected closure of this facility.

F-1h Extensions for Closure Time [§ 265.113(a), (b)]

Final closure shall be completed within one hundred eighty (180) days of receipt of the last volume of wastes for treatment. Therefore, no extension of closure is necessary. However, RSI reserves the right for extension of closure time when and if it is necessary.

F-2 Post-Closure Plan [§ 265.117, 265.381]

It is RSI's intent to remove all waste and waste residues and contaminated materials at closure. Additionally, RSI operates a storage and treatment facility in accordance with interim status guidelines set forth in 40 CFR Subpart P for thermal treatment units. Therefore, post-closure care requirements are not applicable.

F-3 Closure Cost Estimate [§ 265.142]

The closure cost estimate for implementing the closure plan for this facility is \$20,000. Table F-3 outlines the cost breakdowns for closure of RSI's facility.

F-4 Financial Assurance Mechanism For Closure [§ 265.143]

RSI has elected to demonstrate financial assurance for closure through the use of a Closure Trust Fund. Exhibit F-2 presents the documentation required to demonstrate financial assurance under this mechanism.

F-5 Liability Requirements [§ 265.147]

RSI has chosen to demonstrate compliance with liability requirements through subscription to liability insurance policies. Please see Exhibit F-3 for a copy of RSI's liability insurance policy.

CLOSURE PLAN

List of Tables

Table F-1: Analytical Technique to be Used for Closure Certification and Maximum Concentration of Contaminants for Characteristic of TC Toxicity

Table F-2: Anticipated Closure Schedule for RSI Facility

Table F-3: RSI Closure Cost Estimate

TABLE F-1

Analytical Technique to be used for Closure Certification and Maximum
Concentration of Contaminants for Characteristic of TC Toxicity¹

EPA HW Number ²	Constituent	Method Number	Regulatory Level Mg/l
D018	Benzene	1311	0.5
D019	Carbon Tetrachloride	1311	0.5
D020	Chlordane	1311	0.03
D021	Chlorobenzene	1311	100.0
D022	Chloroform	1311	6.0
D023	o-Cresol	1311	200.0
D024	m-Cresol	1311	200.0
D025	p-Cresol	1311	200.0
D026	Cresol	1311	200.0
D027	1,4-Dichlorobenzene	1311	7.5
D028	1,2-Dichloroethane	1311	0.5
D029	1,1-Dichloroethylene	1311	0.7
D030	2,4-Dinitrotoluene	1311	0.13 ³
D031	Heptachlor (and its epoxide)	1311	0.008
D032	Hexachlorobenzene	1311	0.13 ³
D033	Hexachlorobutadiene	1311	0.5
D034	Hexachloroethane	1311	3.0
D035	Methyl ethyl ketone	1311	200.0
D036	Nitrobenzene	1311	2.0
D037	Pentachlorophenol	1311	100.0
D038	Pyridine	1311	5.0 ³
D039	Tetrachloroethylene	1311	0.7
D040	Trichloroethylene	1311	0.5
D041	2,4,5-Trichlorophenol	1311	400.0

¹ Source: Federal Register, Vol. 55, #61, 40 CFR PART 261 et al."Hazardous Waste Management Systems; Identification and Listing of Hazardous Waste; Toxicity Characteristics Revisions; Final Rule".

² EPA Hazardous Waste Number.

³ Quantitation limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level.

TABLE F-2

Anticipated Closure Schedule for RSI Facility
(Following Final Shipment Received)

Milestone	Action	Cumulative Days
1	Notify EPA and state and local officials in writing of planned closure	0
2	Last volume of waste treated at RSI facility from inventory	45
3	Begin closure	46
4	Complete required sampling of the contaminated storage area	53
5	Receive analytical confirmation of clean closure of storage area	74
6	Complete equipment and vehicle decontamination, and sampling of treatment area	104
7	Receive analytical confirmation of clean closure of treatment area	125
8	Complete engineers closure certification, and additional required activities	170
9	Submit closure certification to EPA, state and local officials	180

TABLE F-3

RSI Closure Cost Estimate [§ 265.142]

The following costs are associated with required actions in the event of closure of the RSI's Marcus Hook, PA facility. Costs are estimated in accordance with applicable regulations for the performance of closure activities by third parties, where necessary [§ 265.142 (a)(2)]. In the event of closure, acceptance of waste will be stopped and the pre-treatment inventory of wastes will be processed on site, or transported to RSI's Arizona facility. Costs associated with the treatment and supporting analysis for material inventories on site at any time will be built in to funds collected at the time of acceptance and are not applicable in this estimate.

Description	Cost
Sampling and analysis in accordance with RSI's closure sampling protocol:	\$8,000
Additional analysis where required:	\$3,000
Transportation allowance for wastes:	\$5,000
Engineering fees for certification of closure:	\$2,000
Miscellaneous cost allowance:	\$2,000
Closure Cost Estimate Total:	\$20,000

CLOSURE PLAN
LIST OF EXHIBITS

Exhibit F-1: RSI Disposal Services Roster

Exhibit F-2: Closure Trust Fund

Exhibit F-3: Liability Insurance Policy

EXHIBIT F-1

Disposal Services Roster

City Environmental
1923 Frederick St.
Detroit, MI 48211

Chem Met Services
18550 Allen Rd.
Wyandotte, MI 48192

US Ecology, Inc.
P.O. Box 578
Beatty, NV 89003

Cameron-Yakima Inc.
1414 S. First St.
Yakima, WA 98901

EXHIBIT F-2

Closure Trust Fund

Trust Agreement

Trust Agreement, the "Agreement", entered into as of February 21, 1992, by and between Recycling Sciences International, Inc., a Delaware corporation, the "Grantor", and LaSalle National Trust N.A., the "Trustee".

Whereas, the United States Environmental Protection Agency, "EPA", an agency of the United States Government, has established certain regulations applicable to the Grantor, requiring that an owner or operator of a hazardous waste management facility shall provide assurance that funds will be available when needed for closure and/or post-closure care of the facility.

Whereas, the Grantor has elected to establish a trust to provide all or part of such financial assurance for the facilities identified herein.

Whereas, the Grantor, acting through its duly authorized officers, has selected the Trustee to be the trustee under this Agreement, and the Trustee is willing to act as trustee.

Now, therefore, the Grantor and the Trustee agree as follows:

Section 1. Definitions As used in this Agreement:

(a) The term "Grantor" means the owner or operator who enters into this Agreement and any successors or assigns of the Grantor.

(b) The term "Trustee" means the Trustee who enters into this Agreement and any successor Trustee.

Section 2. Identification of Facilities and Cost Estimates. This Agreement pertains to the facilities and cost estimates identified on attached Schedule A.

Section 3. Establishment of Fund. The Grantor and the Trustee hereby establish a trust fund, the "Fund", for the benefit of EPA. The Grantor and the Trustee intend that no third party have access to the Fund except as herein

provided. The Fund is established initially as consisting of the property, which is acceptable to the Trustee, described in Schedule B attached hereto. Such property and any other property subsequently transferred to the Trustee is referred to as the Fund, together with all earnings and profits thereon, less any payments or distributions made by the Trustee pursuant to this Agreement. The Fund shall be held by the Trustee, IN TRUST, as hereinafter provided. The Trustee shall not be responsible nor shall it undertake any responsibility for the amount or adequacy of, nor any duty to collect from the Grantor, any payments necessary to discharge any liabilities of the Grantor established by EPA.

Section 4. Payment for Closure and Post-Closure Care. The Trustee shall make payments from the Fund as the EPA Regional Administrator shall direct, in writing, to provide for the payment of the costs of closure and/or post-closure care of the facilities covered by this Agreement. The Trustee shall reimburse the Grantor or other persons as specified by the EPA Regional Administrator from the Fund for closure and post-closure expenditures in such amounts as the EPA Regional Administrator shall direct in writing. In addition, the Trustee shall refund to the Grantor such amounts as the EPA Regional Administrator specifies in writing. Upon refund, such funds shall no longer constitute part of the Fund as defined herein.

Section 5. Payments Comprising the Fund. Payments made to the Trustee for the Fund shall consist of cash or securities acceptable to the Trustee.

Section 6. Trustee Management. The Trustee shall invest and reinvest the principal and income of the Fund and keep the Fund invested as a single fund, without distinction between principal and income, in accordance with general investment policies and guidelines which the Grantor may communicate in writing to the Trustee from time to time, subject, however, to the provisions of this section. In investing, reinvesting, exchanging, selling, and managing the Fund, the Trustee shall discharge his duties with respect to the trust fund solely in the

interest of the beneficiary and with the care, skill, prudence, and diligence under the circumstances then prevailing which persons of prudence, acting in a like capacity and familiar with such matters, would use in the conduct of an enterprise of a like character and with like aims; except that:

(i) Securities or other obligations of the Grantor, or any other owner or operator of the facilities, or any of their affiliates as defined in the Investment Company Act of 1940, as amended, 15 U.S.C. 80a-2.(a), shall not be acquired or held, unless they are securities or other obligations of the Federal or a State government;

(ii) The Trustee is authorized to invest the Fund in time or demand deposits of the Trustee, to the extent insured by an agency of the Federal or State government; and

(iii) The Trustee is authorized to hold cash awaiting investment or distribution uninvested for a reasonable time and without liability for the payment of interest thereon.

Section 7. Commingling and Investment. The Trustee is expressly authorized in its discretion:

(a) To transfer from time to time any or all of the assets of the Fund to any common, commingled, or collective trust fund created by the Trustee in which the Fund is eligible to participate, subject to all of the provisions thereof, to be commingled with the assets of other trusts participating therein; and

(b) To purchase shares in any investment company registered under the Investment Company Act of 1940, 15 U.S.C. 80a-1 et seq., including one which may be created, managed, underwritten or to which investment advice is rendered or the shares of which are sold by the Trustee. The Trustee may vote such shares in its discretion.

Section 8. Express Powers of Trustee. Without in any way limiting the powers and discretions conferred upon the Trustee by the other provisions of this Agreement or by law, the Trustee is expressly authorized and empowered:

(a) To sell, exchange, convey, transfer, or otherwise dispose of any property held by it, by public or private sale. No person dealing with the Trustee shall be bound to see to the application of the purchase money or to inquire into the validity or expediency of any such sale or other disposition;

(b) To make, execute, acknowledge, and deliver any and all documents of transfer and conveyance and any and all other instruments that may be necessary or appropriate to carry out the powers herein granted:

(c) To register any securities held in the Fund in its own name or in the name of a nominee and to hold any security in bearer form or in book entry, or to combine certificates representing such securities with certificates of the same issue held by the Trustee in other fiduciary capacities, or to deposit or arrange for the deposit of such securities in a qualified central depository even though, when so deposited, such securities may be merged and held in bulk in the name of the nominee of such depository with other securities deposited therein by another person, or to deposit or arrange for the deposit of any securities issued by the United States Government, or any agency or instrumentality thereof, with a Federal Reserve bank, but the books and records of the Trustee shall at all times show that all such securities are part of the Fund;

(d) To deposit any cash in the Fund in interest-bearing accounts maintained or savings certificates issued by the Trustee, in its separate corporate capacity, or in any other banking institution affiliated with the Trustee, to the extent insured by an agency of the Federal or State government; and

(e) To compromise or otherwise adjust all claims in favor of or against the Fund.

Section 9. Taxes and Expenses. All taxes of any kind that may be assessed or levied against or in respect of the Fund and all brokerage commissions incurred by the Fund shall be paid from the Fund. All other expenses incurred by the Trustee in connection with the administration of this Trust, including fees for legal services rendered to the Trustee, the compensation of the Trustee to the extent not paid directly by the Grantor, and all other proper charges and disbursements of

the Trustee shall be paid from the Fund.

Section 10. Annual Valuation. The Trustee shall annually, at least 30 days prior to the anniversary date of establishment of the Fund, furnish to the Grantor and to the appropriate EPA Regional Administrator a statement confirming the value of the Trust. Any securities in the Fund shall be valued at market value as of no more than 60 days prior to the anniversary date of establishment of the Fund. The failure of the Grantor to object in writing to the Trustee within 90 days after the statement has been furnished to the Grantor and the EPA Regional Administrator shall constitute a conclusively binding assent by the Grantor, barring the Grantor from asserting any claim or liability against the Trustee with respect to matters disclosed in the statement.

Section 11. Advice of Counsel. The Trustee may from time to time consult with counsel, who may be counsel to the Grantor, with respect to any question arising as to the construction of the Agreement or any action to be taken hereunder. The Trustee shall be fully protected, to the extent permitted by law, in acting upon the advice of counsel.

Section 12. Trustee Compensation. The Trustee shall be entitled to reasonable compensation for its services as agreed upon in writing from time to time with the Grantor.

Section 13. Successor Trustee. The Trustee may resign or the Grantor may replace the Trustee, but such resignation or replacement shall not be effective until the Grantor has appointed a successor trustee and this successor accepts the appointment. The successor trustee shall have the same powers and duties as those conferred upon the Trustee hereunder. Upon the successor trustee's acceptance of the appointment, the Trustee shall assign, transfer, and pay over to the successor trustee the funds and properties then constituting the Fund. If for any reason the Grantor cannot or does not act in the event of the resignation of

the Trustee, the Trustee may apply to a court of competent jurisdiction for the appointment of a successor trustee or for instructions. The successor trustee shall specify the date on which it assumes administration of the trust in a writing sent to the Grantor, the EPA Regional Administrator, and the present Trustee by certified mail 10 days before such change becomes effective. Any expenses incurred by the Trustee as a result of any of the acts contemplated by this Section shall be paid as provided in Section 9.

Section 14. Instructions to the Trustee. All orders, requests, and instruction by the Grantor to the Trustee shall be in writing, signed by such persons as are designated in the attached Exhibit A or such other designees as the Grantor may designate by amendment to Exhibit A. The Trustee shall be fully protected in acting without inquiry in accordance with the Grantor's orders, requests, and instructions. All orders, requests, and instructions by the EPA Regional Administrator to the Trustee shall be in writing, signed by the EPA Regional Administrators of the Regions in which the facilities are located, or their designees, and the Trustee shall act and shall be fully protected in acting in accordance with such orders, requests, and instructions. The Trustee shall have the right to assume, in the absence of written notice to the contrary, that no event constituting a change or a termination of the authority of any person to act on behalf of the Grantor or EPA hereunder has occurred. The Trustee shall have no duty to act in the absence of such orders, requests, and instructions from the Grantor and/or EPA, except as provided for herein.

Section 15. Notice of Non-Payment. The Trustee shall notify the Grantor and the appropriate EPA Regional Administrator, by certified mail within 10 days following the expiration of the 30-day period after the anniversary of the establishment of the Trust, if no payment is received from the Grantor during that period. After the pay-in period is completed, the Trustee shall not be required to send a notice of nonpayment.

Section 16. Amendment of Agreement. This Agreement may be amended by an instrument in writing executed by the Grantor, the Trustee, and the appropriate EPA Regional Administrator, or by the Trustee and the appropriate EPA Regional Administrator if the Grantor ceases to exist.

Section 17. Irrevocability and Termination. Subject to the right of the parties to amend this Agreement as provided in Section 16, this Trust shall be irrevocable and shall continue until terminated at the written agreement of the Grantor, the Trustee, and the EPA Regional Administrator, or by the Trustee and the EPA Regional Administrator, if the Grantor ceases to exist. Upon termination of the Trust, all remaining trust property, less final trust administration expenses, shall be delivered to the Grantor.

Section 18. Immunity and Indemnification. The Trustee shall not incur personal liability of any nature in connection with any act or omission, made in good faith, in the administration of this Trust, or in carrying out any directions by the Grantor or the EPA Regional Administrator issued in accordance with this Agreement. The Trustee shall be indemnified and saved harmless by the Grantor or from the Trust Fund, or both, from and against any personal liability to which the Trustee may be subjected by reason of any act or conduct in its official capacity, including all expenses reasonably incurred in its defense in the event the Grantor fails to provide such defense.

Section 19. Choice of Law. This Agreement shall be administered, construed, and enforced according to the laws of the State of ~~(refer to Attachment A)~~. *Alaska* ^{enc.} *9758*

Section 20. Interpretation. As used in this Agreement, words in the singular include the plural and words in the plural include the singular. The descriptive headings for each Section of this Agreement shall not affect the interpretation or the legal efficacy of this Agreement.

IN WITNESS whereof, the parties have caused this Agreement to be executed by their respective officers duly authorized and their corporate seals to be hereunto affixed and attested as of the date first above written: The parties below certify that the wording of this Agreement is identical to the wording specified in 40 CFR 264.151(a)(1) as such regulations were constituted on the date first above written.

RECYCLING SCIENCES INTERNATIONAL, INC.

BY: Mark Danheiser
Title: Executive Vice President

(Bank Name)

BY: J. Kit Silver
Title: ASSISTANT VICE PRESIDENT

State of IL

County of: COOK

On this 21st day of Feb 1992, before me personally came MARK PURCHETT, to me known, who, being by me duly sworn, did depose and say that she/he resides at 10505 GOLF RD. ORLAND PARK, IL, that she/he is EXECUTIVE VICE-PRESIDENT of Recycling Sciences International, Inc., the corporation described in and which executed the above instrument; that she/he knows the seal of said corporation; that the seal affixed to such instrument is such corporate seal; that it was so affixed by order of the Board of Directors of said corporation, and that she/he signed his/her name thereto by like order.

Joyce L. Kelly
Notary Public

My Term of Office Expires 12-10-94



Attachment A

Recycling Sciences International, Inc. Facilities Listing

Following is a list of RSI facilities for which financial assurance is demonstrated by the attached Closure Trust Fund. This attachment meets requirements outlined in 40 CFR 264.151 (a), Section 2 of the trust agreement. RSI's use of this trust fund for the facilities listed below demonstrates compliance with standards outlined in 40 CFR 265.143 (g), and more generally in 40 CFR 265.143 (a).

Facility Location	Closure Cost Estimate
Recycling Sciences Center EPA ID# AZD982429805 16255 W. Avra Valley Highway Marana, AZ 85653	\$60,000.00
Recycling Sciences Center EPA ID# MID985582329 4935 Hannan Rd. Wayne, MI 48184	\$20,000.00
Recycling Sciences Center EPA ID# MSD985968619 2373 Artesia Rd. Columbus, MS 39701	\$20,000.00
Recycling Sciences Center EPA ID# PAD987283439 210 E. 10th St. Marcus Hook, PA 19061	\$20,000.00
Total Combined Closure Costs	\$120,000.00

Schedule 'B'

RECYCLING SCIENCES INTERNATIONAL, INC.

Northern Trust
Certificates of Deposit

L of C #	Certificate #	Location	Due Date	Amt
S242458	2127977	Wayne, MI	9-24-92	\$1,000.00
			Interest*	\$76.05
S242457	2127975	Marcus Hook, PA	9-24-92	\$1,000.00
			Interest*	\$76.05
S242456	2127976	Starkville, MS	9-24-92	\$1,000.00
			Interest*	\$76.05
S242455	2127974	Marana, AZ	9-24-92	\$3,000.00
			Interest*	\$228.16
Total LC=				\$6000.00
Total Interest*=				\$456.31
Total on Deposit				\$6456.31

*Interest amounts are accrued as of 9-24-91

Exhibit A
RSI Designees:

Thomas P. Dunne
Chief Executive Officer

Mark Burchett
Executive Vice President

Cornelius M. Ryan
Chief Financial Officer

EXHIBIT F-3

Liability Insurance Policy

HAZARDOUS WASTE FACILITY CERTIFICATE OF LIABILITY INSURANCE

1. Planet Insurance Company, (the "Insurer"), of 4 Penn Center Plaza, Philadelphia, PA. 19103, hereby certifies that it has issued liability insurance covering bodily injury and property damage to RECYCLING SCIENCES INTERNATIONAL, INC. (the "insured"), of 9801 N. Trico Road, Marana, AZ 85653 in connection with the insured's obligation to demonstrate financial responsibility under 40 CFR 264.147 or 265.147. The coverage applies to RECYCLING SCIENCES INTERNATIONAL, INC., 9801 N. Trico Road, Marana, AZ 85653, EPA ID #AZD982429805 for sudden and nonsudden accidental occurrences. The limits of liability are \$1,000,000 each occurrence and \$2,000,000 annual aggregate, exclusive of legal defense costs. The coverage is provided under policy number NT1259925, issued on September 25, 1990. The effective date of said policy is September 25, 1990.

2. The Insurer further certifies the following with respect to the insurance described in Paragraph 1:

(a) Bankruptcy or insolvency of the insured shall not relieve the Insurer of its obligations under the policy.

(b) The Insurer is liable for the payment of amounts within any deductible applicable to the policy, with the right of reimbursement from the insured for any such payment made by the Insurer. This provision does not apply with respect to that amount of any deductible for which coverage is demonstrated as specified in 40 CFR 264.147(f) or 265.147(f).

(c) Whenever requested by a Regional Administrator of the U.S. Environmental Protection Agency (EPA), the Insurer agrees to furnish to the Regional Administrator a signed duplicate original of the policy and all endorsements.

(d) Cancellation of the insurance, whether by the Insurer or the insured, will be effective only upon written notice and only after the expiration of sixty (60) days after a copy of such written notice is received by the Regional Administrator(s) of the EPA Region(s) in which the facility(ies) is (are) located.

(e) Any other termination of the insurance will be effective only upon written notice and only after the expiration of thirty (30) days after a copy of such written notice is received by the Regional Administrator(s) of the EPA Region(s) in which the facility(ies) is (are) located.

I hereby certify that the wording of this instrument is identical to the wording specified in 40 CFR 264.151(j) as such regulation was constituted on the date first above written, and that the Insurer is licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer, in one or more States.


(Signature of Authorized Representative of Insurer)

Paul M. Murdoch, Assistant Vice President

Authorized Representative of Planet Insurance Company
c/o Environmental Compliance Services, Inc.
One East Uwenlan Ave., Suite 300, Exton, PA 19341

ACORD. CERTIFICATE OF INSURANCEISSUE DATE (MM/DD/YY)
12/09/91**PRODUCER**

Burchett & Associates, Inc.
2400 W. 95th Street
Suite 405
Evergreen Park, IL 60642

INSURED

Recycling Sciences International, Inc.
30 S. Wacker Drive
Suite 1420
Chicago, IL 60606

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND
CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE
DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE
POLICIES BELOW.

COMPANIES AFFORDING COVERAGE

COMPANY LETTER **A** **Planet Insurance Co.**

COMPANY LETTER **B** **Travelers Insurance Co.**

COMPANY LETTER **C** **CIGNA Insurance Co.**

COMPANY LETTER **D**

COMPANY LETTER **E**

COVERAGES

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED, NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN. THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIABILITY	LIMITS IN THOUSANDS
	GENERAL LIABILITY				GENERAL AGGREGATE	\$ 5000
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY				PRODUCTS-COMP/OP AGG.	\$ 5000
	<input checked="" type="checkbox"/> CLAIMS MADE OCCUR.	NGB201513301	09/25/91	09/25/92	PERSONAL & ADV. INJURY	\$ 5000
	<input type="checkbox"/> OWNER'S & CONTRACTOR'S PROT.				EACH OCCURRENCE	\$ 5000
					FIRE DAMAGE (Any one fire)	\$ 50
					MED. EXPENSE (Any one person)	\$ 5
	AUTOMOBILE LIABILITY				COMBINED SINGLE LIMIT	\$ 1000
B	<input type="checkbox"/> ANY AUTO					
	<input checked="" type="checkbox"/> ALL OWNED AUTOS	660-198K3129-TIL-91	08/16/91	08/16/92	BODILY INJURY (Per person)	\$
	<input checked="" type="checkbox"/> SCHEDULED AUTOS				BODILY INJURY (Per accident)	\$
	<input checked="" type="checkbox"/> HIRED AUTOS				PROPERTY DAMAGE	\$
	<input checked="" type="checkbox"/> NON-OWNED AUTOS					
	<input type="checkbox"/> GARAGE LIABILITY					
A	EXCESS LIABILITY	NTA125992501			EACH OCCURRENCE	\$ 1000
	<input checked="" type="checkbox"/> UMBRELLA FORM	Poll. Legal Liab.	09/25/91	09/25/92	AGGREGATE	\$ 2000
	<input checked="" type="checkbox"/> OTHER THAN UMBRELLA FORM					
C	WORKER'S COMPENSATION AND EMPLOYERS' LIABILITY	WWC C3 7140119	07/01/91	07/01/92	STATUTORY LIMITS	
					EACH ACCIDENT	\$ 500
					DISEASE-POLICY LIMIT	\$ 500
					DISEASE-EACH EMPLOYEE	\$ 500
B	OTHER				Total Value	*\$2,161,706-RC
	Property-\$5000	660-198K3129-TIL-91	08/16/91	08/16/92		
	Deductible - All Risk					
	Excl. Flood & Earthquake					

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/SPECIAL ITEMS

Pollution Legal Liability - \$50,000 Deductible Per Occurrence, *AZ: \$2,076,431-Equipment; \$24,000-Computer Equip.; \$1275-Contents, IL: \$50,000-Computer Equip.; \$10,000-Contents

CERTIFICATE HOLDER

Recycling Sciences International, Inc.
30 S. Wacker Drive
Suite 1420
Chicago, IL 60606

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ENDEAVOR TO MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE